VOL. XLI No. 6 JUNE 1956

# MECCANO MAGAZINE

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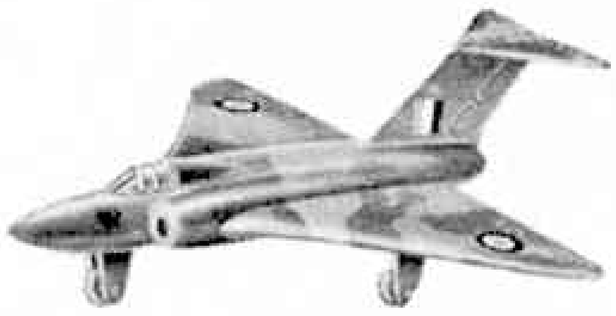
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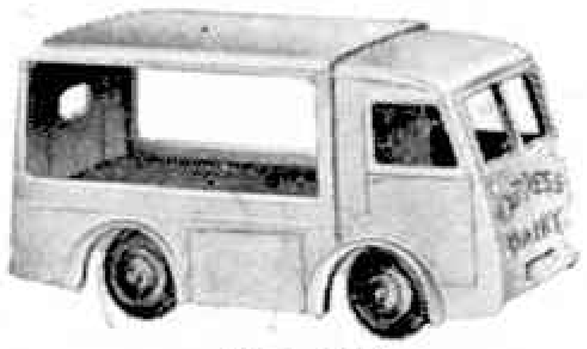
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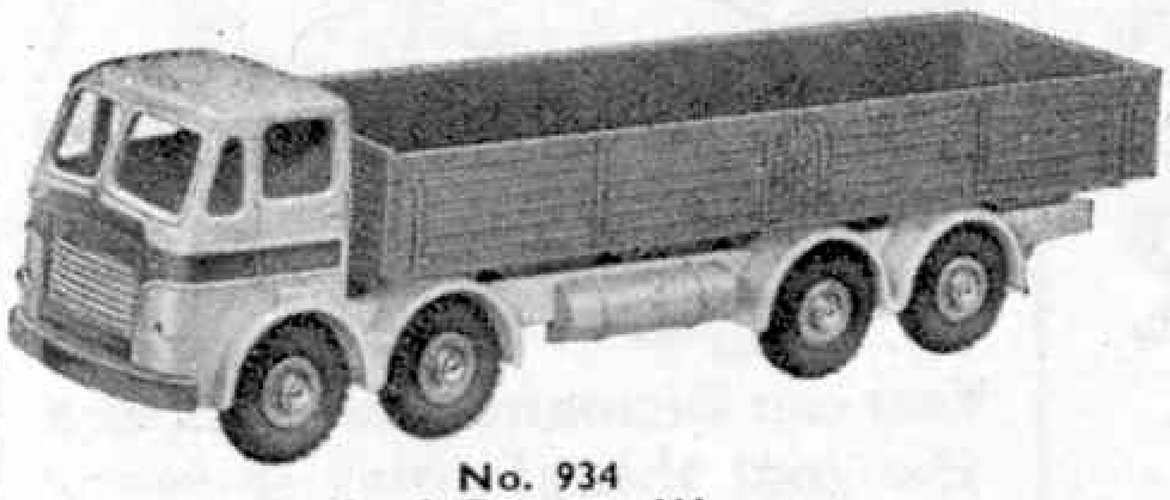


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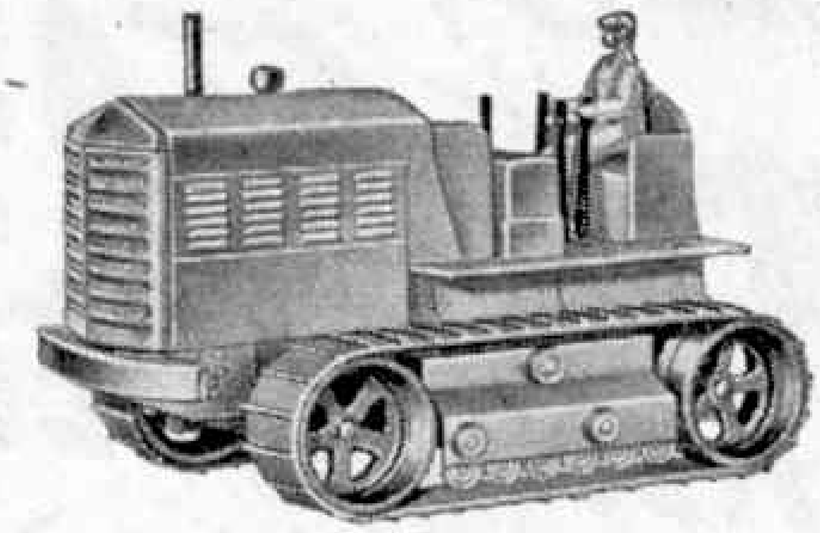
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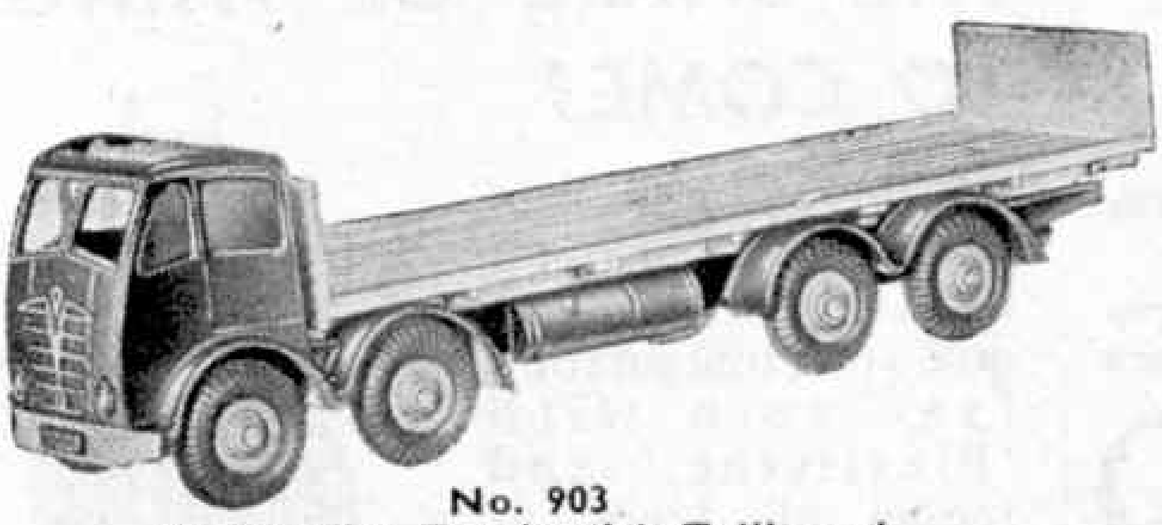
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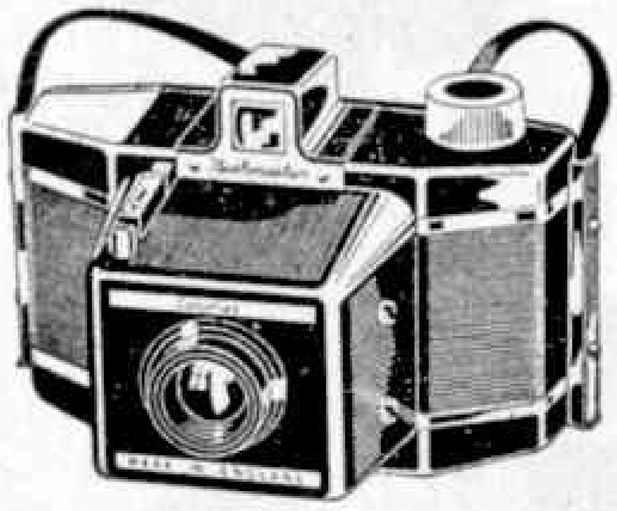
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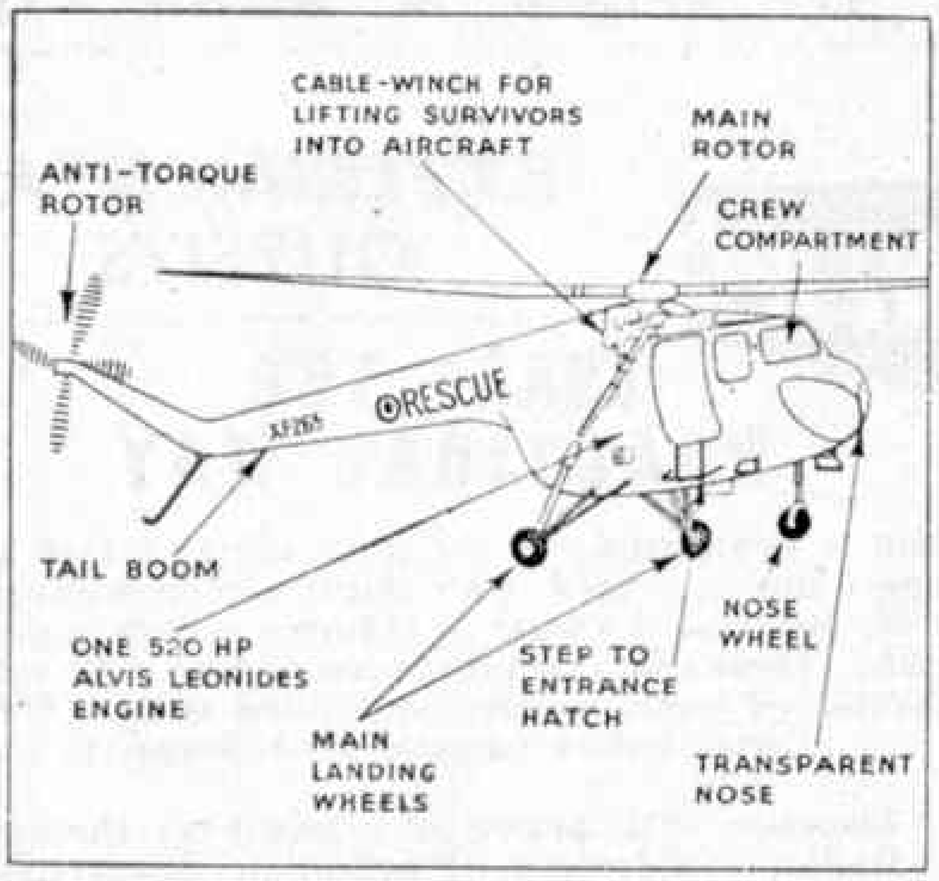
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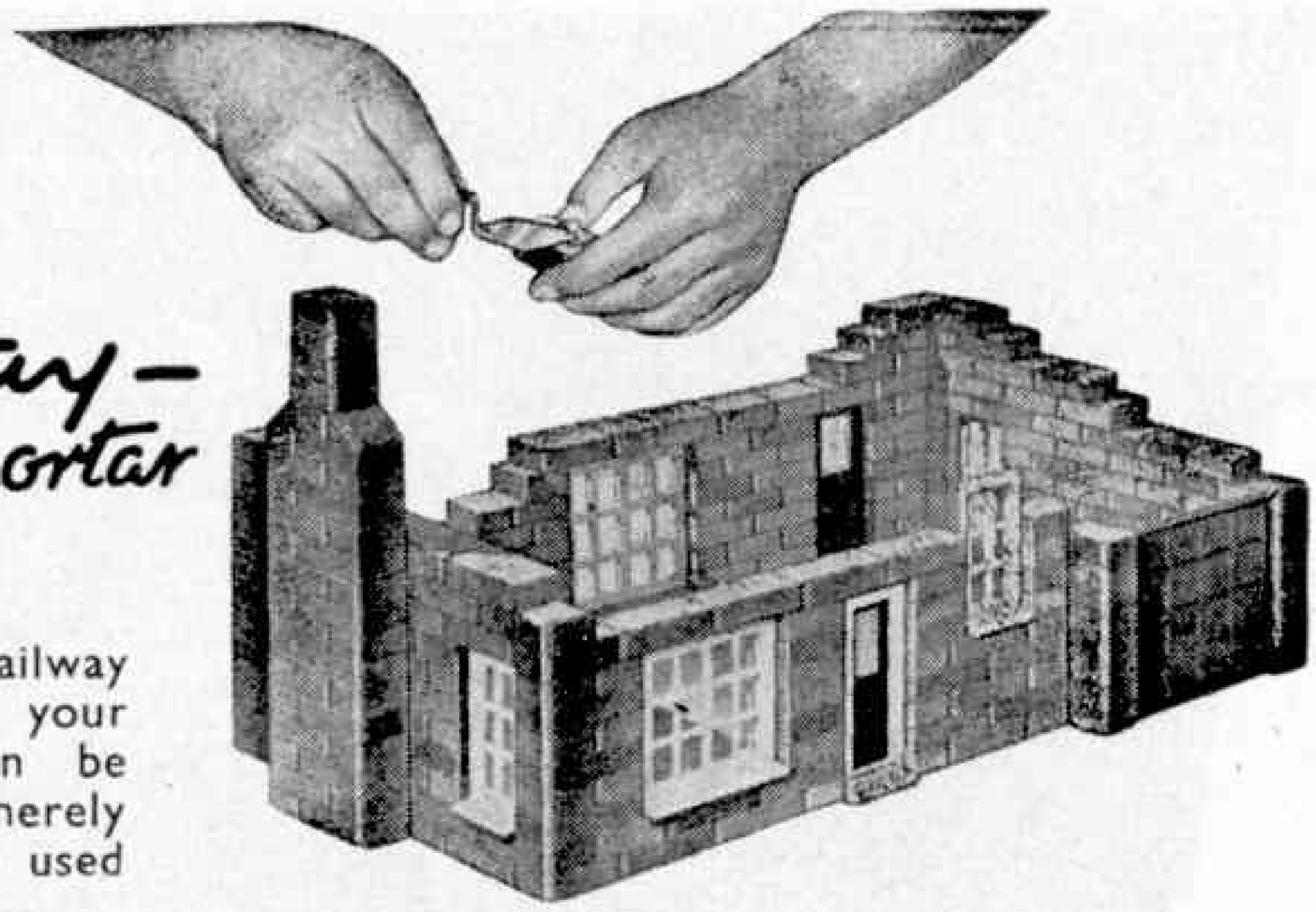
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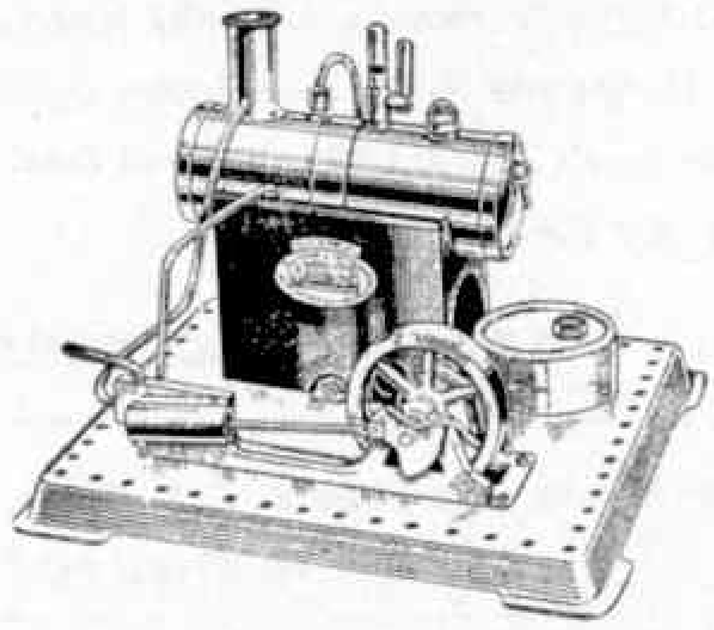
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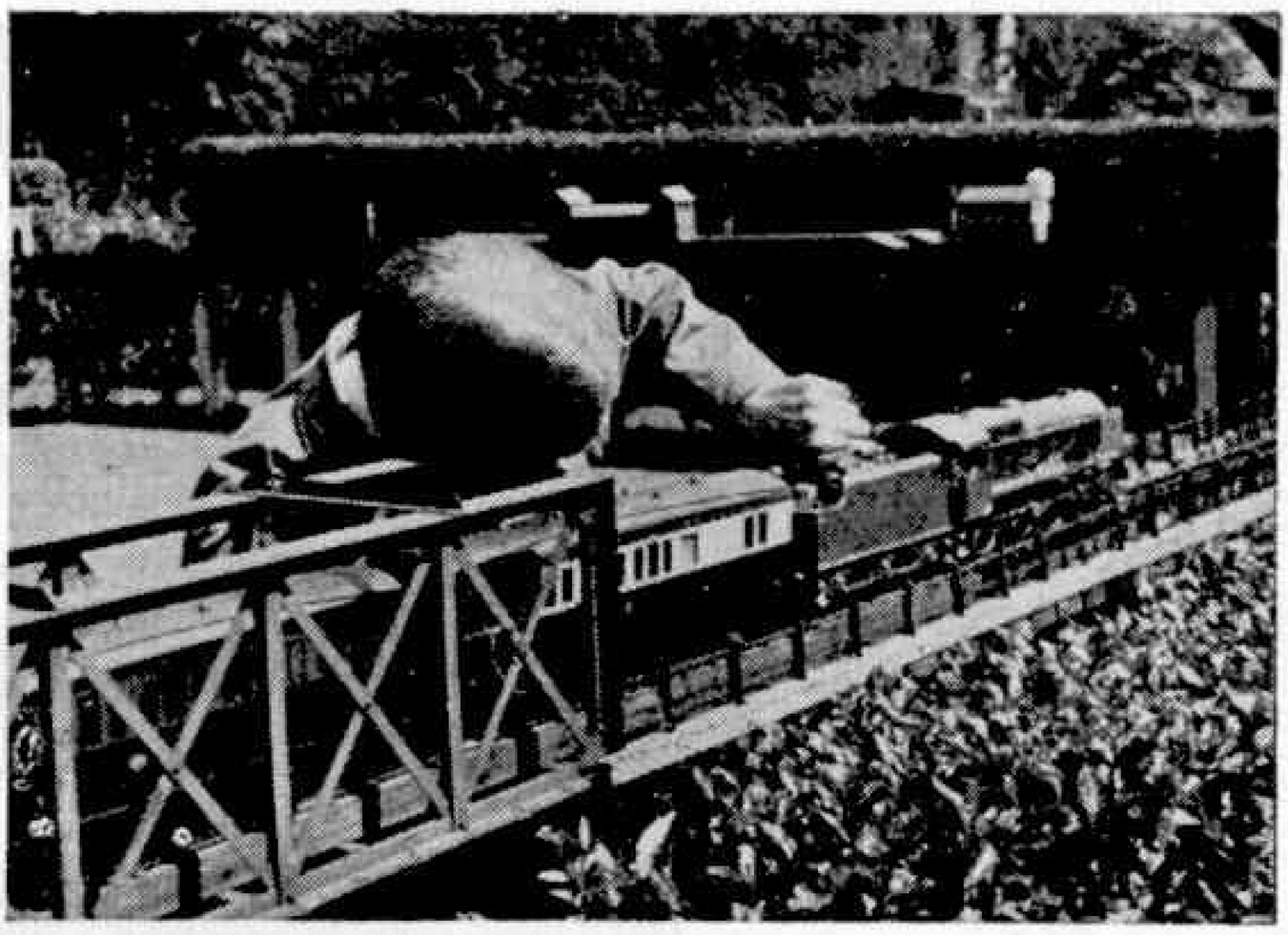
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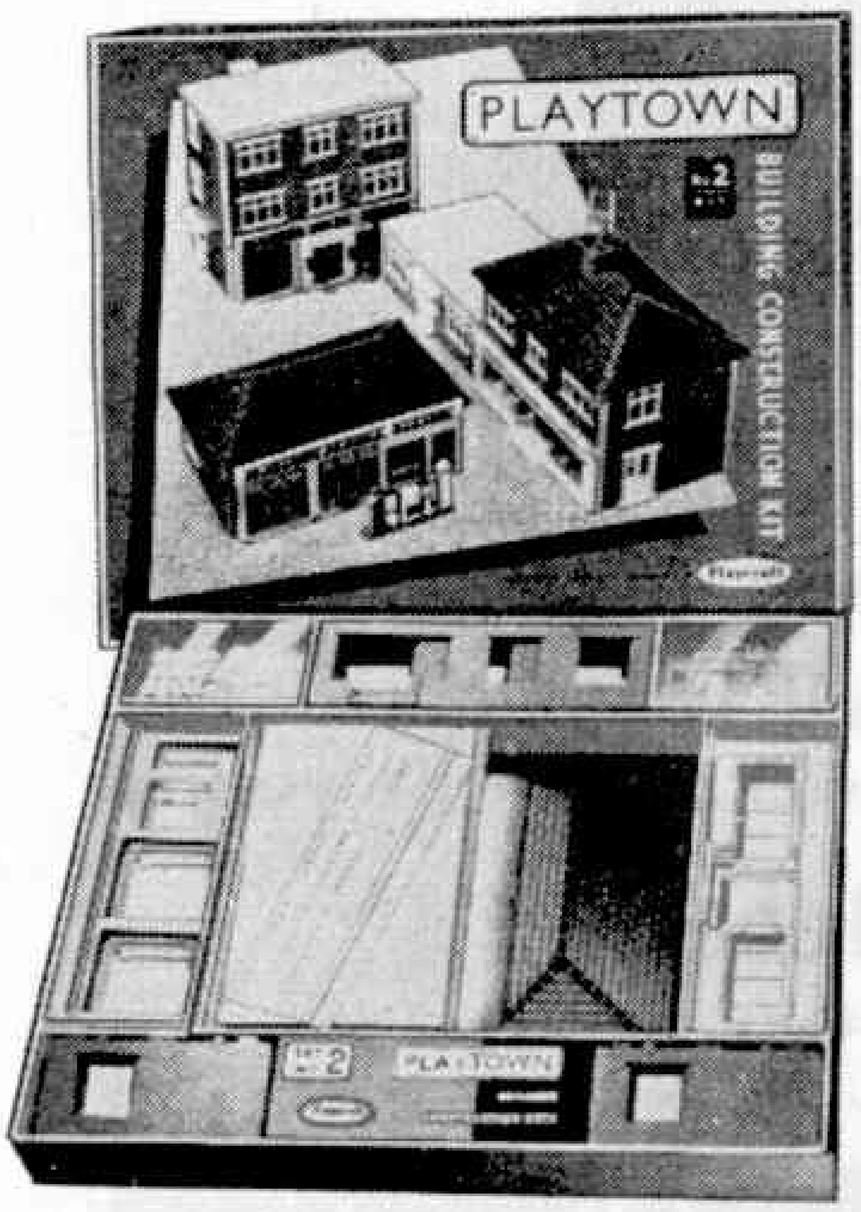
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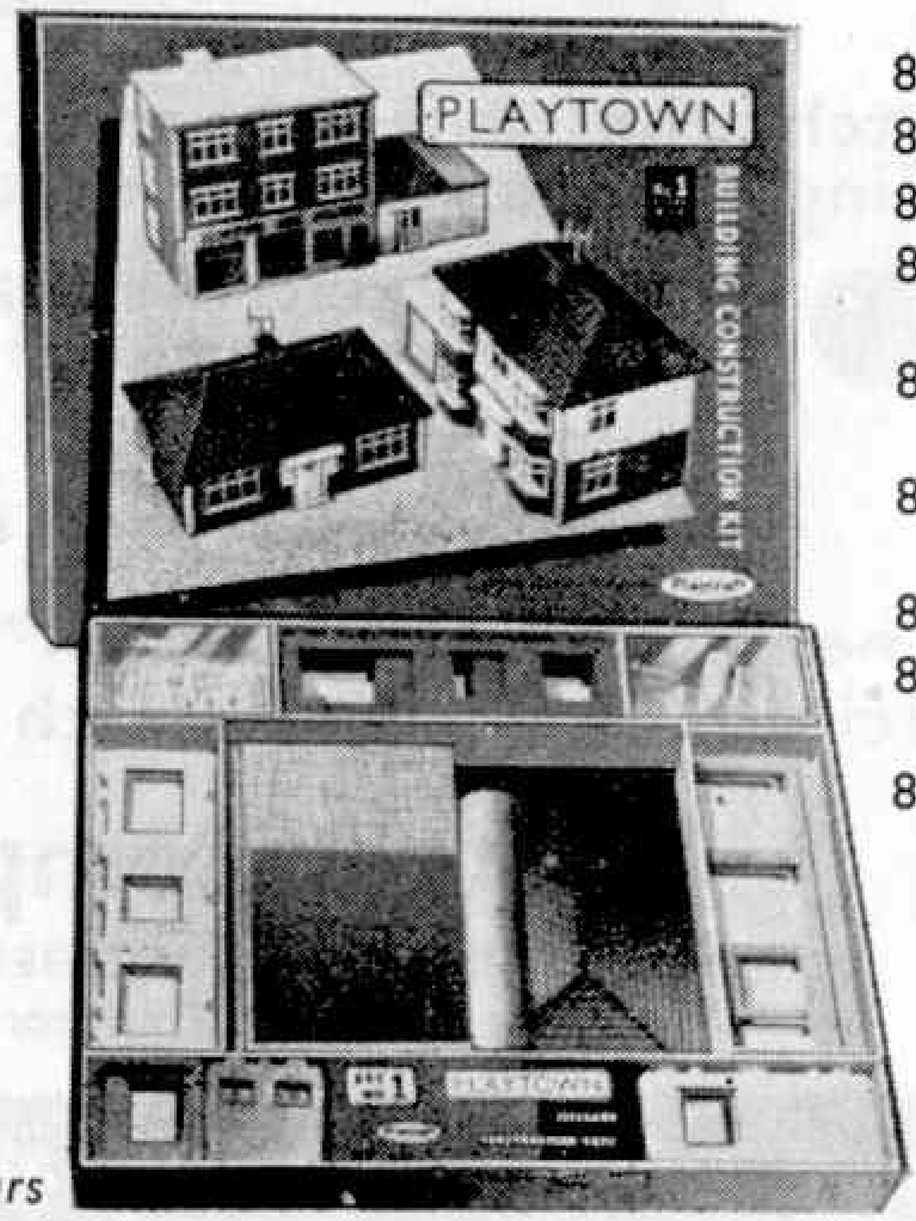
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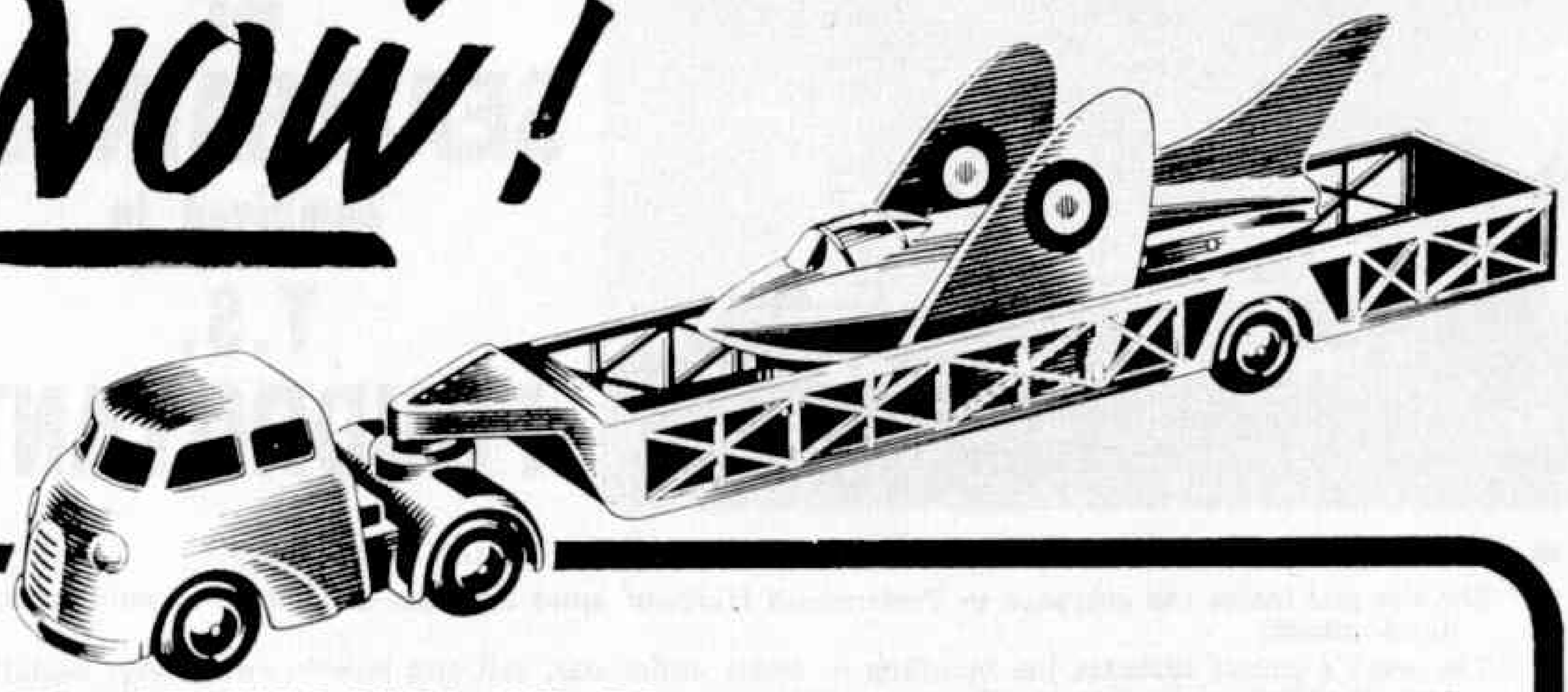




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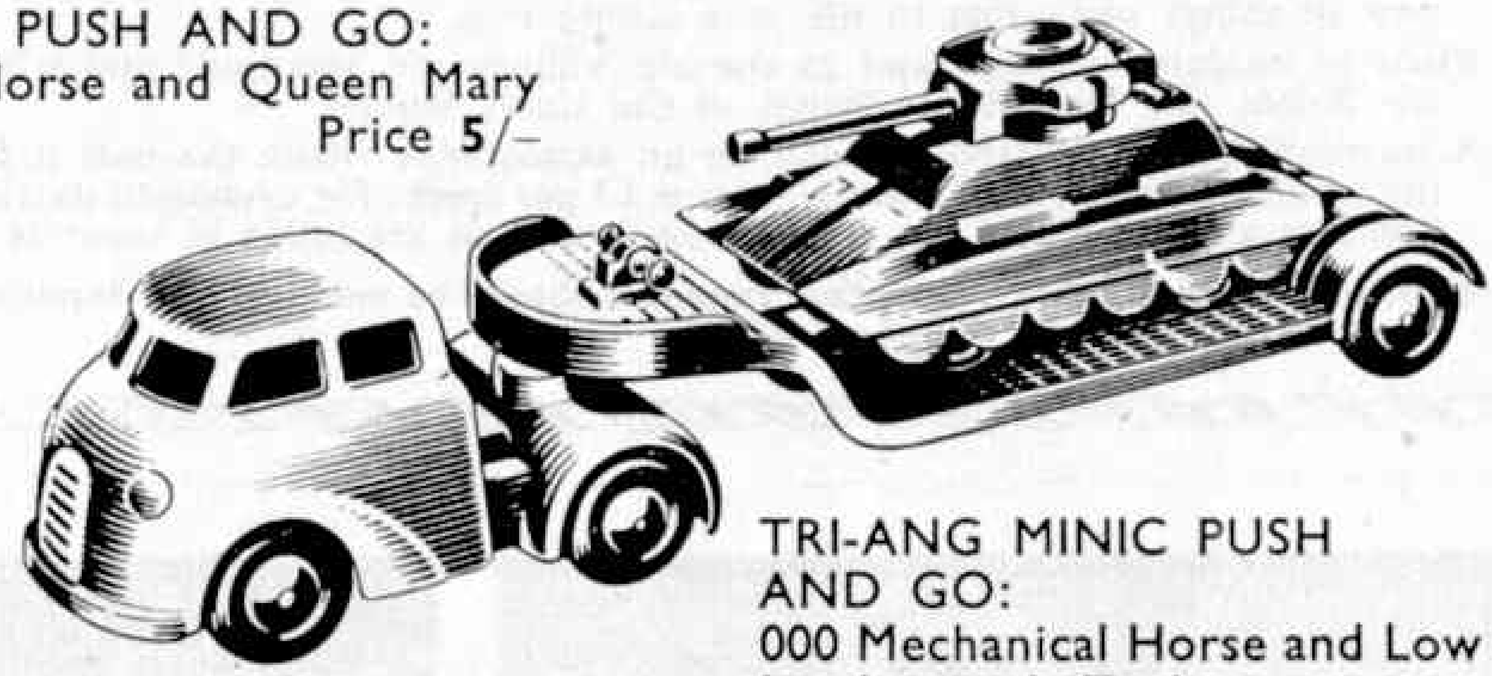
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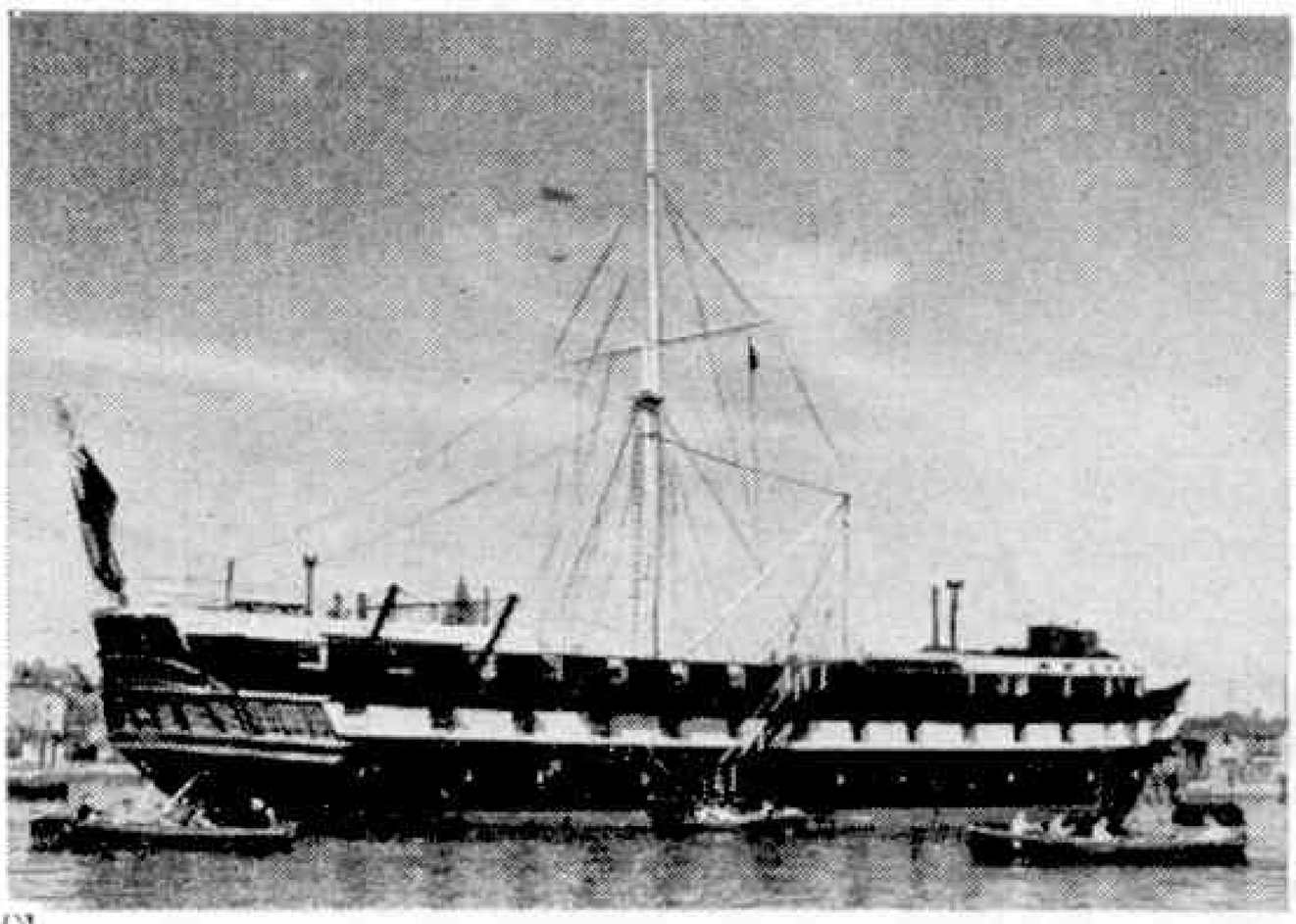
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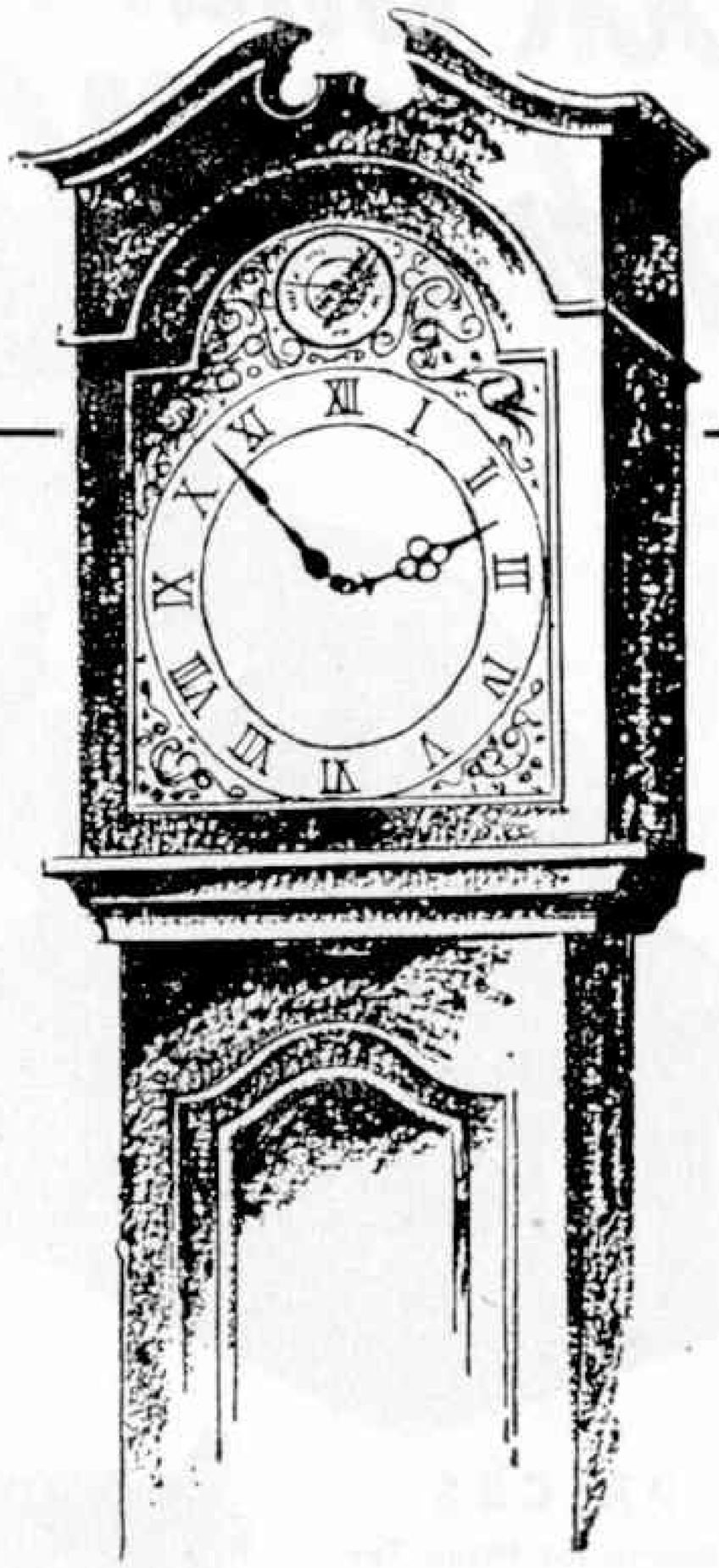
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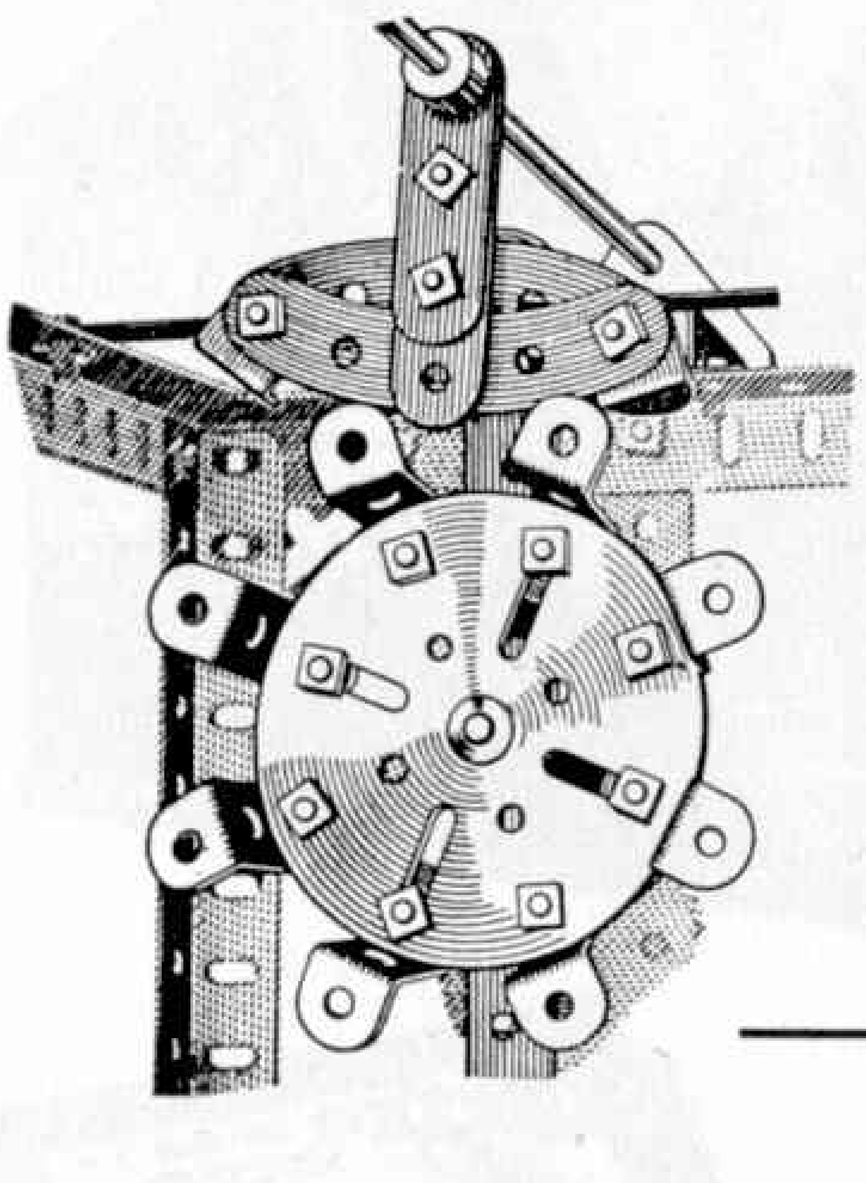

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*Here is a pendulum-operated escapement mechanism built with Meccano.*

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**Next Month:** "THE BANANA BOATS ARE IN!"


# MECCANO MAGAZINE

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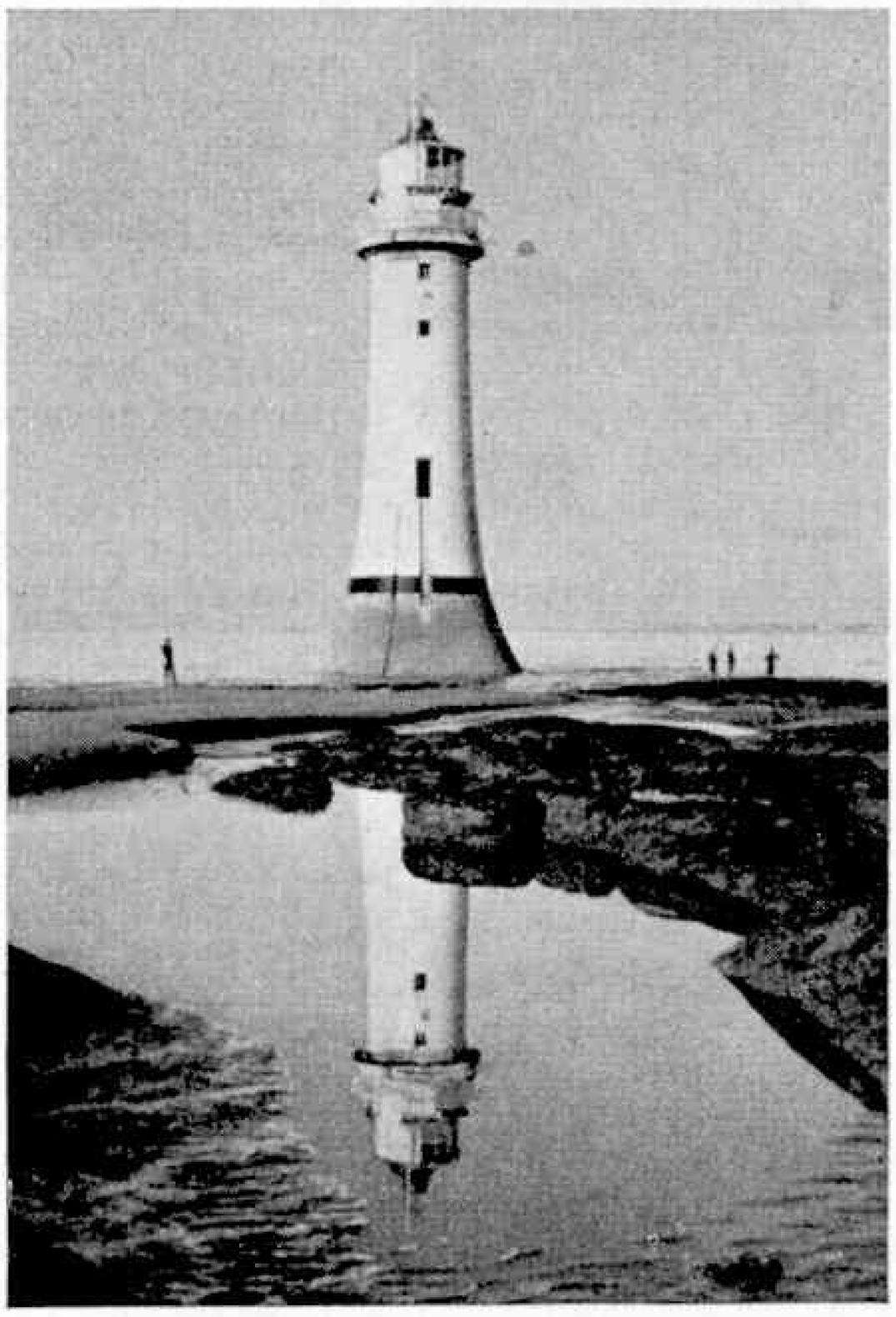
EDITOR : FRANK RILEY, B.Sc.

Vol. XLI
No. 6
June 1956


## New Railway Colours

Most of you will probably remember little of the colours of locomotives and passenger coaches before British Railways were formed in 1948, and still fewer will recall the varied liveries of the railway companies that came to an end with grouping 25 years earlier. The passing of these has always been regretted by railway enthusiasts whose memories go back far enough to the time when the individual railways had their own characteristics just as they had their own liveries.

Now comes another change, and curiously enough it almost looks like an effort to get back to what older enthusiasts think of as the great era of British railways. In general passenger coaches in future are to be painted maroon in colour, instead of the crimson and cream now so familiar to us, but Southern Region passenger stock of all kinds is to be green and, most welcome of all to many railway fans of the past, some named trains of the Western Region will be formed of stock painted in the chocolate and cream of the former G.W.R.



**Lighthouse reflections at New Brighton. The beams from the Lighthouse guide ships entering and leaving the Mersey. Photograph by R. Gardner, Wallasey.**

These variations will add historic interest to our railways, but I for one feel sorry that the crimson and cream of present day main line coaches is doomed. It is bright and attractive—when the coaches are clean!—and has the merit that it is very effective on miniature railways. What do you think?

Turning now to the sea, we do not know as much as we should like about the ships and shipping companies of past ages, simply because there were few making any efforts to keep records. This can now be altered. A Ship Spotting organisation, for groups consisting of not more than 12 spotters and a senior spotter, is being organised. Many groups indeed have already been formed. All interested can learn details from Mr. E. C. Talbot-Booth, White Lodge, Nackington, Canterbury. And the movement is open to spotters of all ages.

The Editor



**Confidential conversation. Miss Len Howard with a great tit. Photograph reproduced by permission from Miss Howard's recent book "Living With Birds," published by Collins, Sons and Co. Ltd.**

# Birds About The House

By Garth Christian

IT was the first time I had ever done my "bird watching" by telephone. I was talking to a friend when our conversation was interrupted by a bird. "Here's *Star*, the great tit," said the voice on the 'phone. "She wants to do some tapping."

Clearly over the 'phone I heard my friend rap five times. With the authoritative voice of a headmistress with a rather large form of juniors, she then said: "*Star*, tap five." At once I heard the soft, rhythmic tapping of the great tit as she perched on the screen and struck it with her bill.

My friend, of course, was Miss Len Howard, the pioneer naturalist who shares her cottage with the wild birds. Months after this incident *Star* learnt to tap a set number of times in response to verbal commands. Told to "tap four" she would hammer at the screen perhaps in 2-2 rhythm, and such was her interest in tit mathematics that she did not always trouble to claim the peanut that was offered her as a reward. On one occasion, when told to tap six times, the bird tapped only five times, began to fly to Miss Howard's hand for a nut and then turned back to the screen and rapped once. This incident reveals, as other experiments with caged birds have done, how strong is the number sense of some birds.

The tapping of this *wild* great tit has aroused so much attention in the national press that many people may overlook the fact that tit mathematics are confined to three of the fifteen chapters of Miss Howard's new book *Living With Birds* (Collins, 15s.). Material hardly less important is packed into the other 170 odd pages of this remarkable book. We read how *Pippa*, another great tit, recognised Miss Howard and flew to her hand on the edge of a wood nearly eighteen months after they had last met; we learn also how the great tit *Beauty* brought his lame fledgling *Naomi* to be fed and nursed at Bird Cottage; and how a hedgehog came to call on Miss Howard.

It will be news to most people that birds practice a code of etiquette, the big bird rarely denying to small species the opportunity to feed, even in hard weather. As Miss Howard points out, if all the large species bullied the small birds, the little tits would starve to death when food was scarce. Of course, this code does not apply to hawks and other birds of prey who sometimes find their natural food by eating smaller birds.

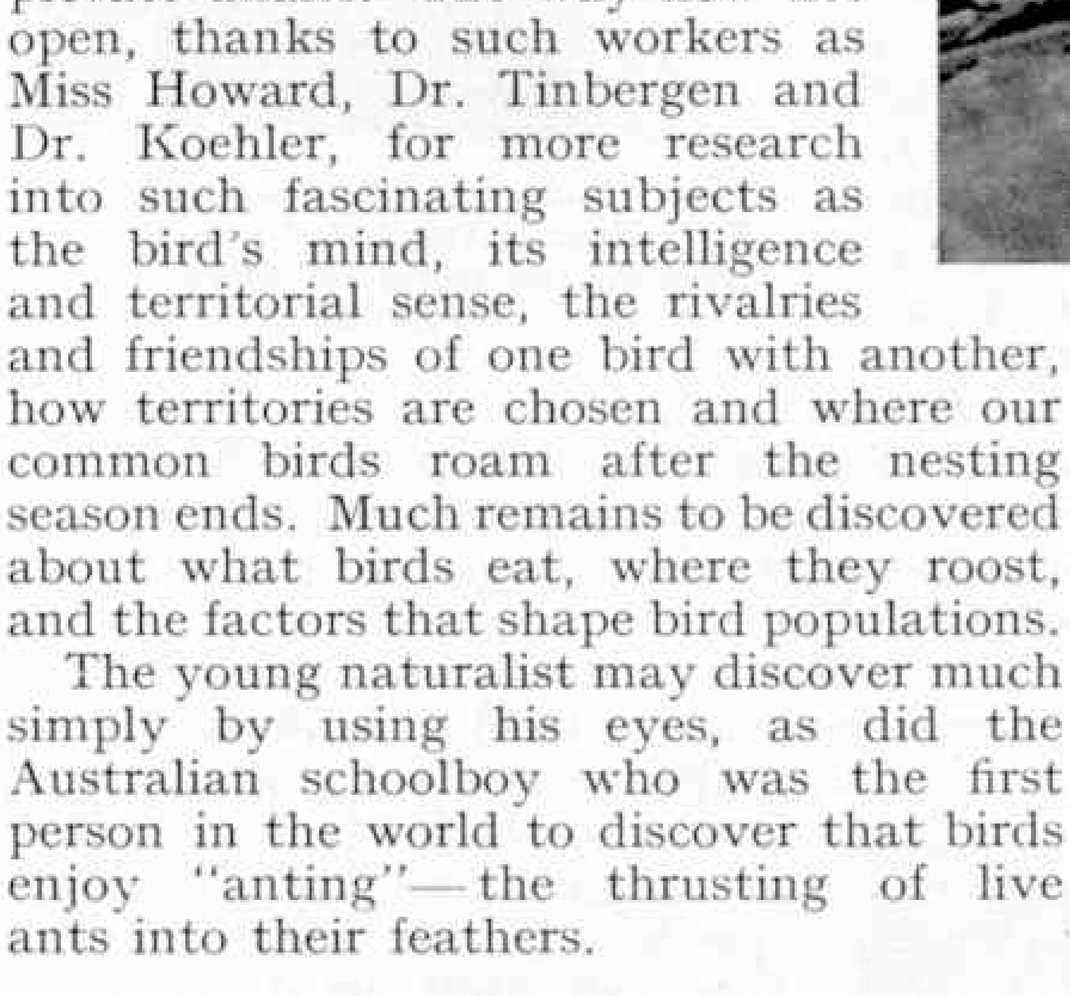
I doubt, too, whether anyone else has noted that most great tits adopt an order of precedence when feeding, the adult male seizing food first though he steps aside and lets his mate feed first in the nesting season.

The young bird watcher of today might well be envied by those of yesterday. Not only has he at hand a host of reasonably cheap and excellent bird books, but he is fortunate in acquiring an interest in our wild creatures just when man's attitude to them is changing. Throughout the 18th and 19th centuries, when all too many attractive birds were shot and caged, scientists concentrated on the formidable tasks of identifying and classifying birds according

to their structure. This job has now been finished. In the present century the experts have been learning much about the nesting habits of birds, how many eggs they usually lay, how long they incubate them and the period that the nestlings remain at home before venturing to use their wings.

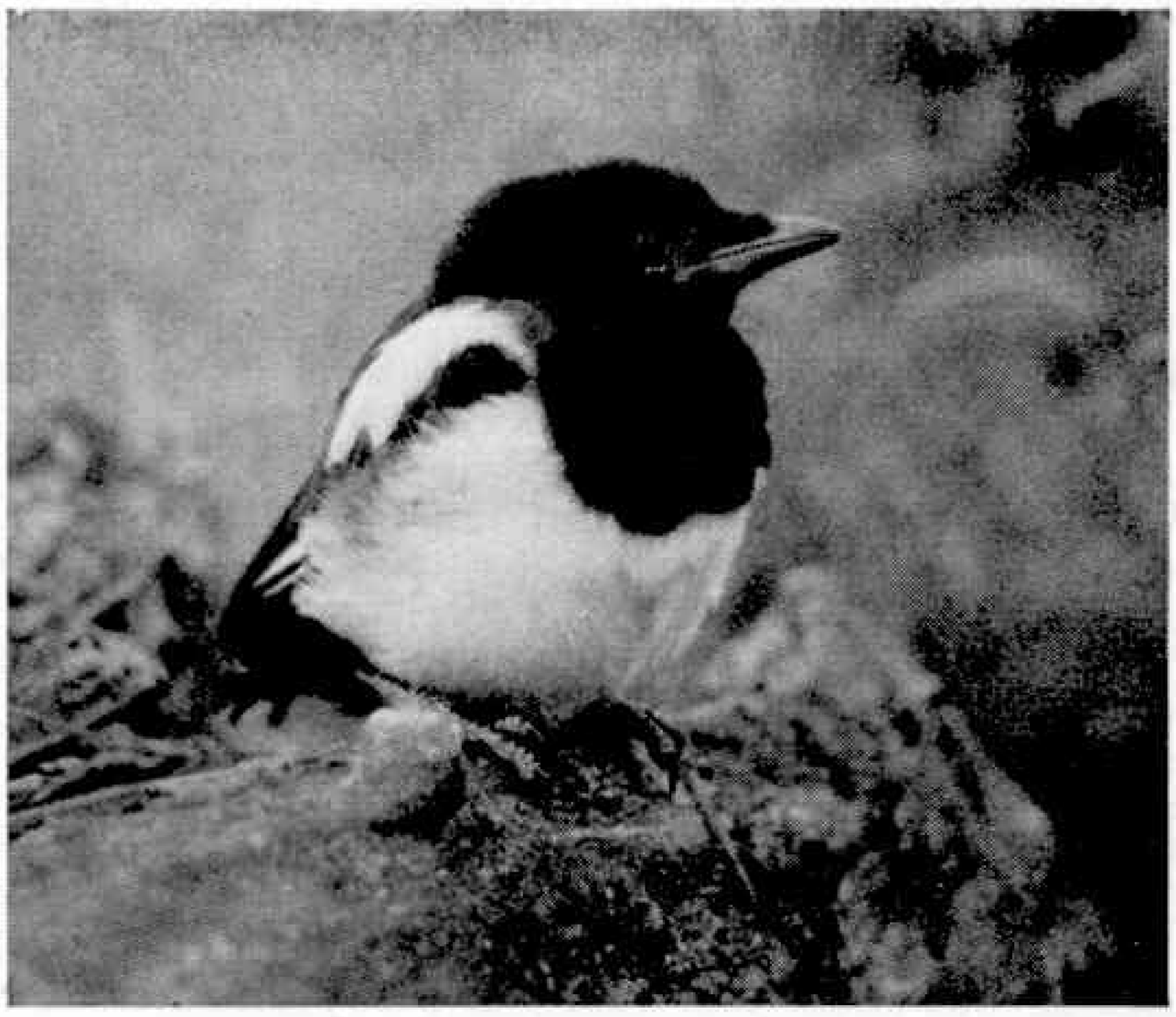
Since so much is now known about nest sanitation and incubation periods, there is little point in continuing to frighten the birds by probing deeply into their private affairs. The way now lies open, thanks to such workers as Miss Howard, Dr. Tinbergen and Dr. Koehler, for more research into such fascinating subjects as the bird's mind, its intelligence and territorial sense, the rivalries and friendships of one bird with another, how territories are chosen and where our common birds roam after the nesting season ends. Much remains to be discovered about what birds eat, where they roost, and the factors that shape bird populations.

The young naturalist may discover much simply by using his eyes, as did the Australian schoolboy who was the first person in the world to discover that birds enjoy "anting"—the thrusting of live ants into their feathers.



**Almost every wild creature likes to bathe in sunlight, not least birds and dragonflies.**

In her first book, *Birds as Individuals* (Collins, 1952), Miss Howard argued that birds that are "frustrated by fear" do not behave normally. Much unintelligent



**A young magpie that did not obey the notice prohibiting visitors to the garden of Bird Cottage.**

behaviour of birds is due to terror prompted by the knowledge that they are being watched. By gaining their utter confidence and friendship, Miss Howard sees birds behaving normally. She was able to follow the strange conflicts of blackbirds in her garden who suffered from a persistent and interfering female whom she called *Stubbs*. She is privileged to watch one bird helping another that is in distress or danger. Sharing her home with the wild birds, she is able to see them as they really are.

Beside the garden gate at Bird Cottage is a notice which reads:

NO VISITORS
NESTING BIRDS
MUST KEEP COTTAGE
QUIET
NO CALLERS

Unfortunately, neither magpies nor cats seem to read the notice—to the dismay of the tits.

Another notice warning visitors—who must be rare indeed if the birds are to thrive—stands near the lawn, which is enclosed by a string fence to ensure that only the birds set foot on it. The trees and hedges are tall and thick, though not so tall that the sun is kept out, for wild creatures invariably love to sunbathe, like the dragonfly that dries its wings in the reeds.

A lavish supply of food is always available for the hundred wild birds who enjoy the freedom of this Sussex cottage. Nuts, fat and cheese are reserved for the tits; meat, raisins and apples are available

(*Continued on page 332*)

# Flying at 1,650 m.p.h.!

By John W. R. Taylor

WHEN you read in the *M.M.* last month that the North American company are designing an aeroplane to fly at 6,600 m.p.h., ten times the speed of sound, at a height of 50 to 100 miles above the Earth, I wonder if you thought "I'll believe that when it happens. It sounds like another American tall story to me." If so, you should read a remarkable new book entitled *Across the High Frontier*,* which tells the story of Major Charles Yeager of the U.S. Air Force.

Now "Chuck" Yeager is one of my good friends, but if he had told me ten years ago that he would fly through the sound barrier in 1947 and reach a speed of 1,650 m.p.h. in 1953, I too might have thought "I'll believe that when it happens."

At that time the barrier was well-named.

The speed of sound is 760 m.p.h. at sea level, dropping to 660 m.p.h. at 36,000 ft.; but aircraft did not have to fly at anything like those speeds to run into trouble. During the war, piston-engined fighters diving at little more than 500 m.p.h. suddenly broke up in the air, for no apparent reason. Only later was it realised that, in passing around their thick curved wing section, the airflow was accelerated to near the speed of sound, so that it formed shock-waves, which were so strong that they could batter the wings or tail off an aeroplane in a few seconds.



**Peter Twiss, D.S.C., test pilot of The Fairey Aviation Co. Ltd., who regained the world air speed record for Britain.**

The Miles company in England was given a contract in 1943 to build a bullet-shaped aircraft known as the M.52, powered by a Whittle jet engine and designed for speeds up to 1,000 m.p.h. Knowing what we do now, it is obvious that this aircraft might have earned for Britain the honour of being first to crack the sound barrier. Instead, the Government decided that flying at such high speeds was too dangerous for human pilots. The half-completed M.52 was abandoned, and we began playing with rocket-models launched in the air from Mosquito bombers.

Meanwhile, the Bell company in America had built for the U.S.A.F. a rocket-powered research aeroplane named the X–1 (Experimental No. 1), which they claimed would be able one day to fly at up to 1,700 m.p.h. One of the few people who believed them was "Chuck" Yeager, a young pilot for whom the war had compressed a lifetime of flying experience into two or three years.



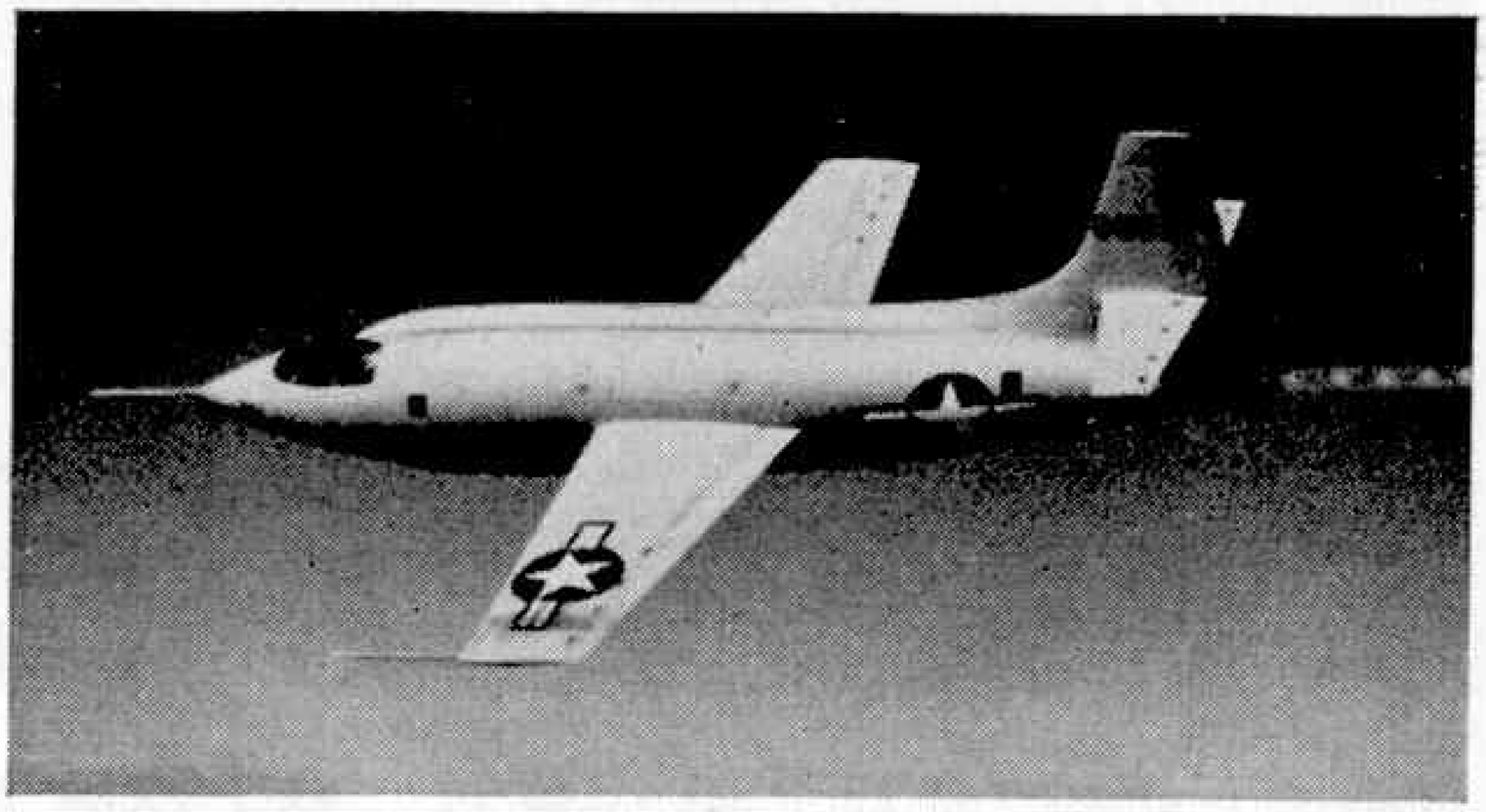

**Major Charles Yeager being congratulated after his 1,650 m.p.h. flight by Larry Bell, of the Bell Aircraft Corporation.**

He was born on a farm in the hills of West Virginia, and he is a quiet-spoken,

* *Published by Victor Gollancz Ltd., price 16/6.*

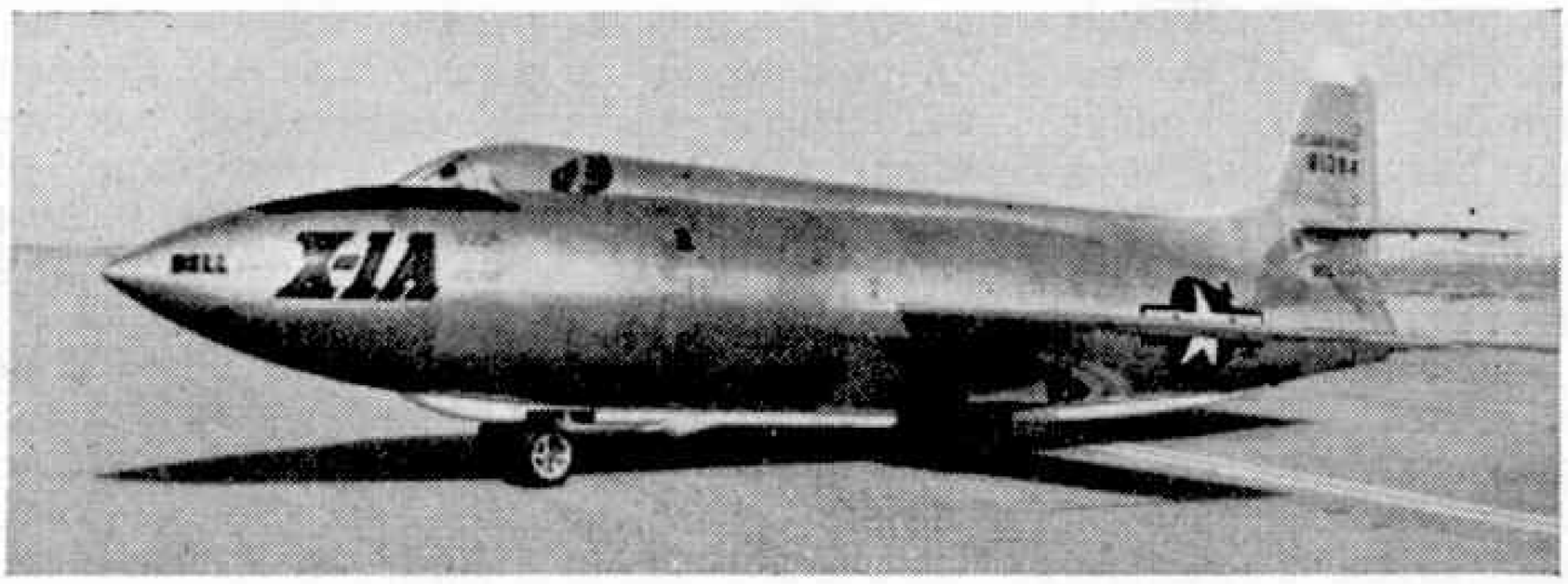
modest, jet-age version of Davy Crockett, with the capable sensitive hands of a man whose life has been spent hunting with gun, fishing rod and fighter 'plane. He looks at you straight, and you sense both the sincerity of the boy from the hill country and the dangers and experiences that have made his eyes seem tired and older than his 33 years.

These qualities and his superbly-disciplined flying led to his choice in 1947 as the pilot to fly the Bell X–1, although it was only four years since he had gained his "wings." In those years, he had flown 64 combat missions, been shot down over France and escaped back to England. He had also destroyed 12 enemy 'planes, and had been awarded the Silver Star with an Oak Leaf Cluster, the Distinguished Flying Cross and a string of other decorations.



The two Bell rocket-powered experimental aircraft in which Major Yeager made aviation history. On the right is the X-1 in which he became the first pilot ever to fly faster than sound. (U.S. Air Force photograph).

Below is shown the X-1A in which he achieved a speed of 1,650 m.p.h. (Bell Aircraft Corp. photograph).




*Across the High Frontier* shows how well Yeager met the rigid requirements of a research pilot, first learning as much as possible about the aircraft on the ground. At the Bell factory, he met the X–1's designers, who told him that it was so strong that a weight equivalent to a six-engined B–36 bomber could be hung from its tiny 3½ in. thick straight wings without breaking them. He sat in its cockpit and, with the aircraft firmly lashed down, got the feel of the 6,000 lb. thrust rocket-motor.

In July 1947 he walked along the catwalk of the Superfortress "mother-plane," 5,000 ft. over the U.S.A.F.'s secret research base in the Mojave desert and, trying not to look down, stepped sideways from a ladder suspended in space into the open doorway of the X–1, cradled in the Superfort's bomb-bay. Soon afterwards, at 20,000 ft., he was dropped for the first time, without using the rocket-motor, and found the X–1 so easy to handle as a glider that he promptly performed three slow rolls.

The first powered flight followed on 29th August and, in the excitement of the moment, Yeager forgot his caution just once. After swooping over the control tower at 3,000 ft., he yanked back the "stick," opened up all four barrels of the rocket-motor and streaked vertically to 35,000 ft. at Mach .85 (85 per cent. of the speed of sound).

From then on, he was content to stick to the plan of increasing the speed a few m.p.h. at a time, nibbling nearer and nearer to Mach 1, feeling the aircraft bucking and buffeting, a little unstable, and yet becoming more and more certain that it could be flown safely through the sound barrier.

The X–1 did not let him down and, in a screeching full-power climb to 45,000 ft., he became the first pilot ever to fly faster than sound on 14th October, 1947. As he passed Mach 1, the buffeting and loss of control stopped and, but for a sudden wild swing of the Mach-meter needle, he would "never have noticed the

smashing of the barrier they used to call the brick wall in the sky."

Yeager and the X–1 had shown that the sound barrier could be hurdled by a tremendously strong aircraft, carefully designed and with a powerful engine. But there was much more to learn before fighters, bombers and air liners could be made to fly safely at supersonic speeds. To solve some of the problems, an improved version of the X–1 was built and in this X–1A, on 12th December, 1953, Yeager achieved a speed that has not yet been beaten.

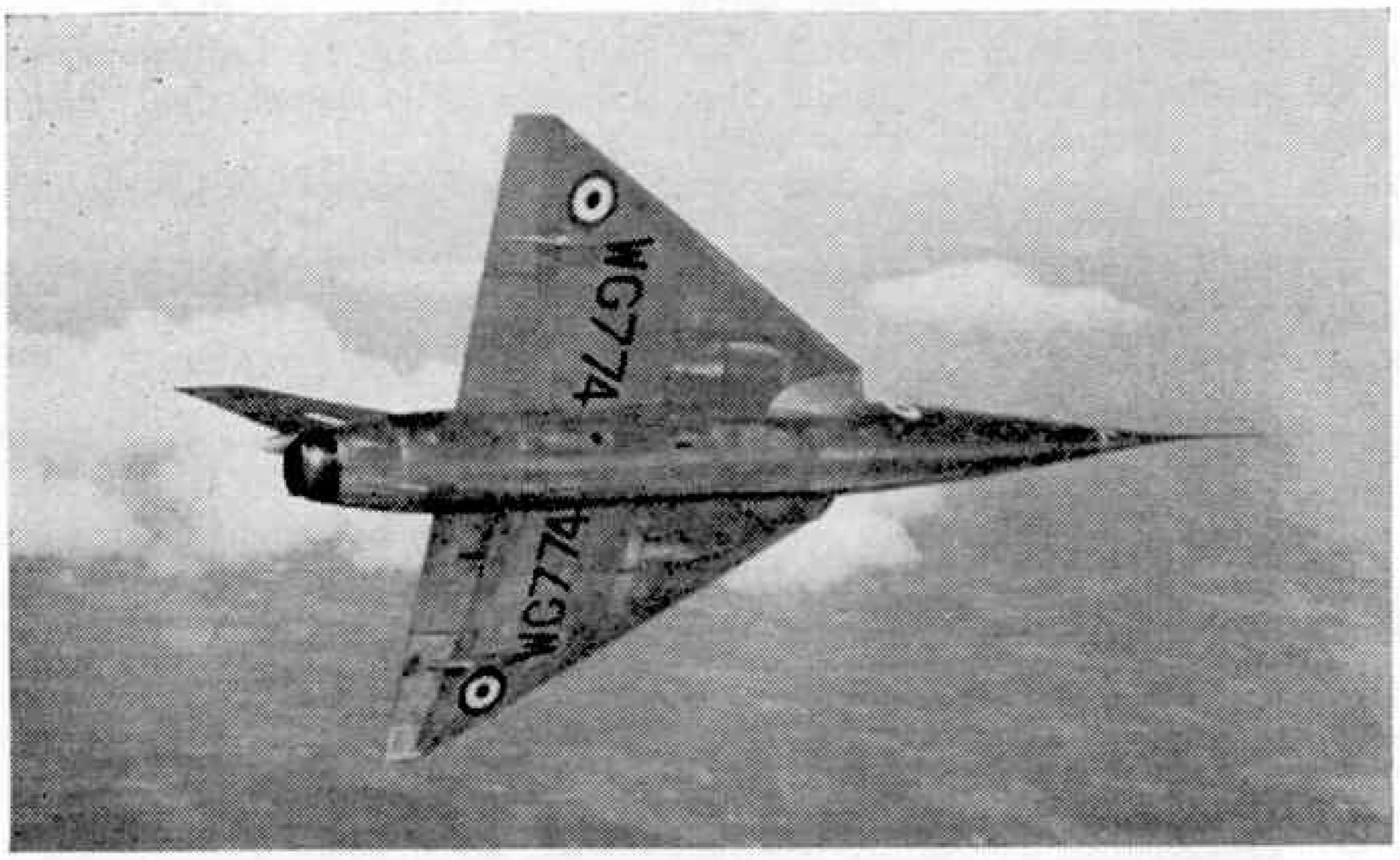
It was very nearly his last flight, because as the X–1A hurtled past 70,000 ft. at 1,650 m.p.h.—more than twice the speed of sound—Yeager suddenly lost control and the aircraft began tumbling crazily in the thin air. Slammed from side to side of the tiny cockpit so hard that the inner lining of the pressure cabin was cracked, he became unconscious and dropped 51,000 ft. in 51 seconds.

The fact that he survived is a tribute to both Yeager and the X–1A. Today he is leading a U.S.A.F. fighter wing in Germany, and there are many who believe he will one day lead the entire U.S.A.F. as Chief of Staff.

Meanwhile, other pilots in other aircraft are continuing the high-speed research where he left off, and the measure of success achieved in England was shown on 10th March this year, when Peter Twiss set up a new world speed record of 1,132 m.p.h. in the Fairey Delta 2.

This speed is, of course, much lower than Yeager's 1,650 m.p.h., but it was no less of an achievement, because the Delta 2 took off under its own power, flew twice along a measured 15 km. (9½ mile) course in straight and level flight and landed back at its base 24 min. later. You may ask "So what?" and the answer is that it proves the Delta 2 to be perhaps the most valuable research aircraft in the world.

It means that this tiny British aircraft can fly for minute after minute at well over 1½ times the speed of sound,




**A striking underside view of the Fairey Delta 2 that shows to advantage the delta wing form of this fine aircraft.**

gathering data that will make the next generation of British aircraft faster, safer and more economical. Instead of relying on almost solid metal and brute force, it reaches high supersonic speeds because its design is right, and a fighter version of the Delta 2 would be a perfectly safe aircraft to entrust to any well-trained service pilot. And it needs no "mother-plane" to lift it into the air, because it has sufficient fuel to climb to height and fly for many minutes at full power.

When I spoke to him, two days after he broke the record, Peter Twiss told me that it flies through the sound barrier so smoothly that the only indication of going supersonic is a slight flick of the instruments, and that its hydraulically-boosted controls make it easier to fly at 1,100 m.p.h. than many ordinary aircraft at half that speed.

Like Yeager, he is modest about his success, young enough to be excited about it, and grateful that he was in the right place at the right time to be the man chosen for the job. Again like Yeager, he has a fine war record, as a naval fighter pilot and on intruder operations in Mosquitoes, during which he shot down enemy aircraft at night over their own airfields and earned a Distinguished Service Cross and bar.

The precise flying that is essential for a carrier-based naval pilot must have played a big part in regaining the world speed

(*Continued on page 332*)



# Motorways for Safety

By W. H. Owens

SAFETY on the roads must depend, first and last, upon the care and good sense of all who use them. But the roads themselves can play an important part in reducing the heavy toll of accidents.

If our roads are to be as safe as possible they must, of course, fit the needs of the traffic. But in Britain at the present time this is very far from being the case. Everywhere, and especially in and around the larger towns and cities, there is growing traffic congestion and muddle, and more and more accidents as the result of it.

Road traffic in this country has increased on an enormous scale over the past thirty or forty years, and the increase has been greatly speeded up since the last war. In 1938 there were about 3,000,000 licensed vehicles on the roads of Great Britain. Today, when threequarters of all goods are carried by road, there are 6,000,000. And it is estimated this number may be doubled yet again in only about eight years' time.

Yet this huge mass of vehicles has to move along roads that were constructed long ago in the leisurely travelling days of horse-drawn coaches. The last trunk road to be built in this island was Telford's London to Holyhead Road, A.5, which was opened to traffic well over 100 years ago. This was a masterpiece of highway engineering at the time, but like every other trunk road it is quite out of date now.

Apart from the local by-pass and arterial roads constructed between the two World Wars, our highway system remains basically as it was at the beginning of the motoring age. Improvements have been carried out in piecemeal fashion here and there, but only the surfaces have really changed for the better.

Even arterial routes like the famous Kingston By-pass or the Great West Road, near London, are quite unable to cope with the volume of traffic they carry every day. Congestion is as bad, and sometimes much worse, on these roads of the 1930's than on many older ones. Moreover, it is on such roads, in busy urban areas, that so many accidents occur.

To cure our present road troubles and, above all, reduce the toll of accidents,

**The picture at the head of the page gives some idea of the congestion on British roads, especially around our cities and towns. It shows a scene at New Malden on the Kingston By-pass. Safe and speedy movement of traffic is impossible on our narrow and crowded roads, and the picture should be compared with those of motor highways in other countries seen on the following pages. All these illustrations are reproduced by courtesy of the British Road Federation Ltd.**

we need highways different from any that have ever been built in Britain so far. What is wanted are roads designed for, and restricted to the use of, motor vehicles. The ordinary all-purpose roads could be very much safer and more efficient if the heavier long-distance traffic were diverted from them



**Elevated motorway at Kansas City, U.S.A. Vehicles leaving the motorway do so down the ramp on the right-hand side. An entry ramp can be seen on the left.**

to special motor roads, or motorways. For wherever traffic congestion is reduced, the risk of accidents is reduced also.

What is a motorway? It is a highway barred to all except motor vehicles, with two separated carriageways, each of sufficient width to accommodate at least two lines of traffic. Drivers can get on or off it only at specially designed safety junctions that allow vehicles to flow smoothly in our out of the traffic stream. It has no traffic crossings on the motorway level. Other roads are taken over it by bridges, or beneath it in subways. All gradients and curves are made as gradual as possible.

Thousands of miles of motorways have been built and are in use in the United States and in various countries of Europe. Many more are under construction. The German autobahnen are probably the best known examples of twentieth-century motorways, but you can find similar roads today in countries such as France, Holland, Belgium, Italy, Sweden and even the tiny state of Luxembourg. Generally speaking, they serve the chief cities and industrial centres, or, as in Germany, link up the tourist centres.

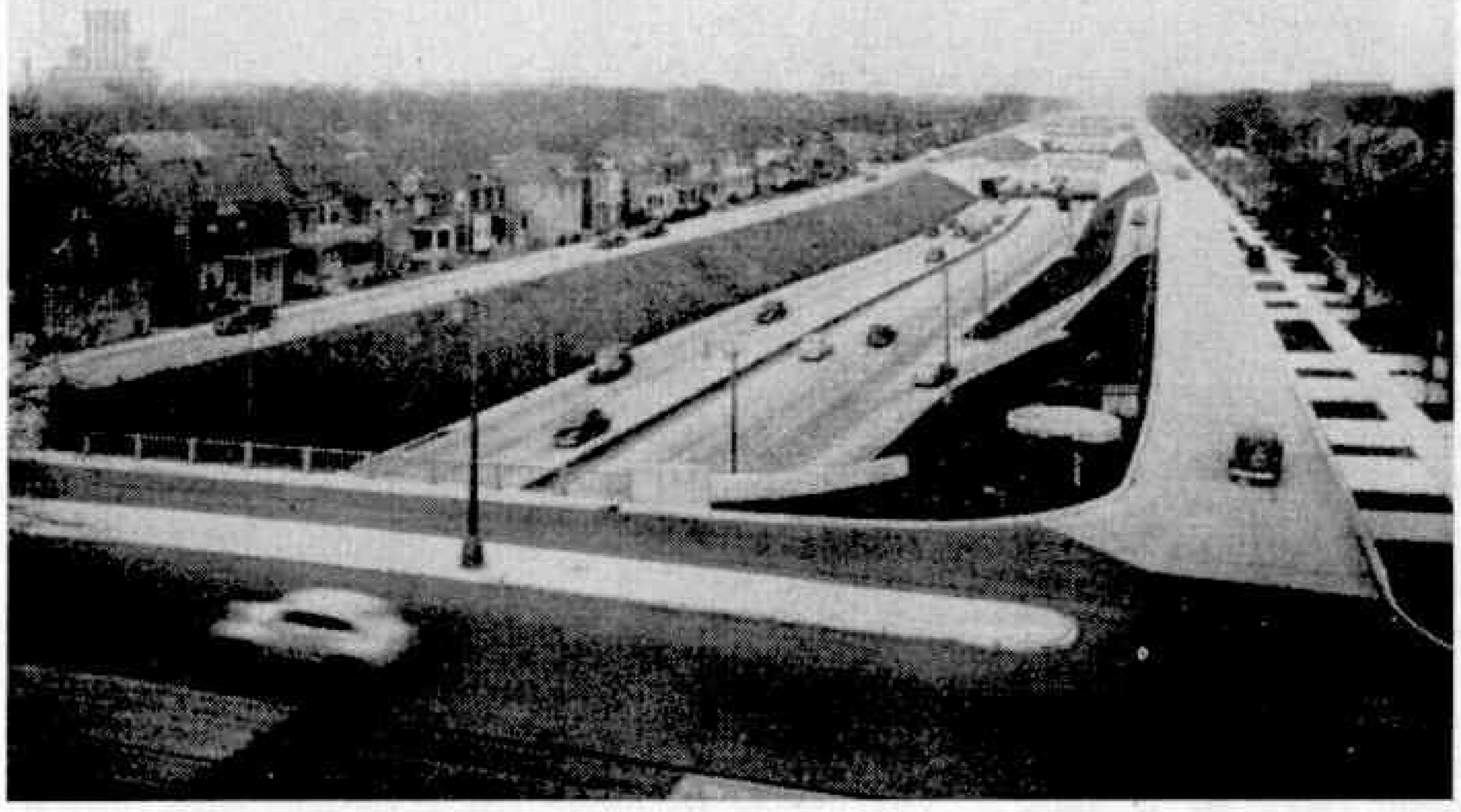
Experience has shown that motorways not only provide a certain cure for traffic congestion, but definitely reduce the rate of accidents. After the Germans had built the first major links of their autobahn network, accident records on these new highways and the older main roads were carefully studied and compared over a period. It was found that accidents on the autobahnen averaged less than one-fifth of the number that occurred on the existing all-purpose roads. On one of America's famous motorways, the Lake Shore Drive at Chicago, the accident rate is about one for every million miles



**A depressed highway built in the heart of Rotterdam to permit a free flow of traffic in a congested area.**

travelled on it. Almost *twenty* times the number of accidents have been reported on ordinary roads in the Chicago neighbourhood!

Vehicles can and do attain high speeds on motorways, and on many such roads abroad a *minimum* speed limit is actually imposed. Some people in Britain have raised objection to the construction of special motor roads here chiefly on that account. But this view completely misunderstands the nature and purpose of motorways.



**This view of the sunken Davison Express Highway in Detroit, taken from a local flyover, shows vehicles going up an exit ramp.**

Speeds of 70–80 miles per hour can be maintained with absolute safety on dual-carriageway roads that run straight mile upon mile, and where pedestrians, cyclists and obstructions such as crossings and traffic lights are never encountered. The separation of opposite traffic streams by a continuous centre mall removes all risk of head-on collisions and permits safe overtaking anywhere. Parking strips at intervals off the highway allow a driver to stop without hindering or endangering the flow of vehicles which may be following behind.

So to condemn the speed of vehicles on a motorway is rather like objecting to 70 m.p.h. express trains on a main railway line. In both cases the track has been specially designed for speed and every possible safety precaution is taken.

For a long time now Britain has lagged behind her Continental neighbours in building roads to meet modern traffic needs, although the Government has announced plans for a London-Yorkshire motorway and a north-south Lancashire motorway. Unfortunately, no date has been given for the start of either of these important projects, which are so urgently needed to speed the movement of materials and products to and from factories in the Midlands and North. The County Surveyor of Lancashire has estimated that the proposed 63-mile motorway through his county would alone save 16,000 road casualties in 20 years.

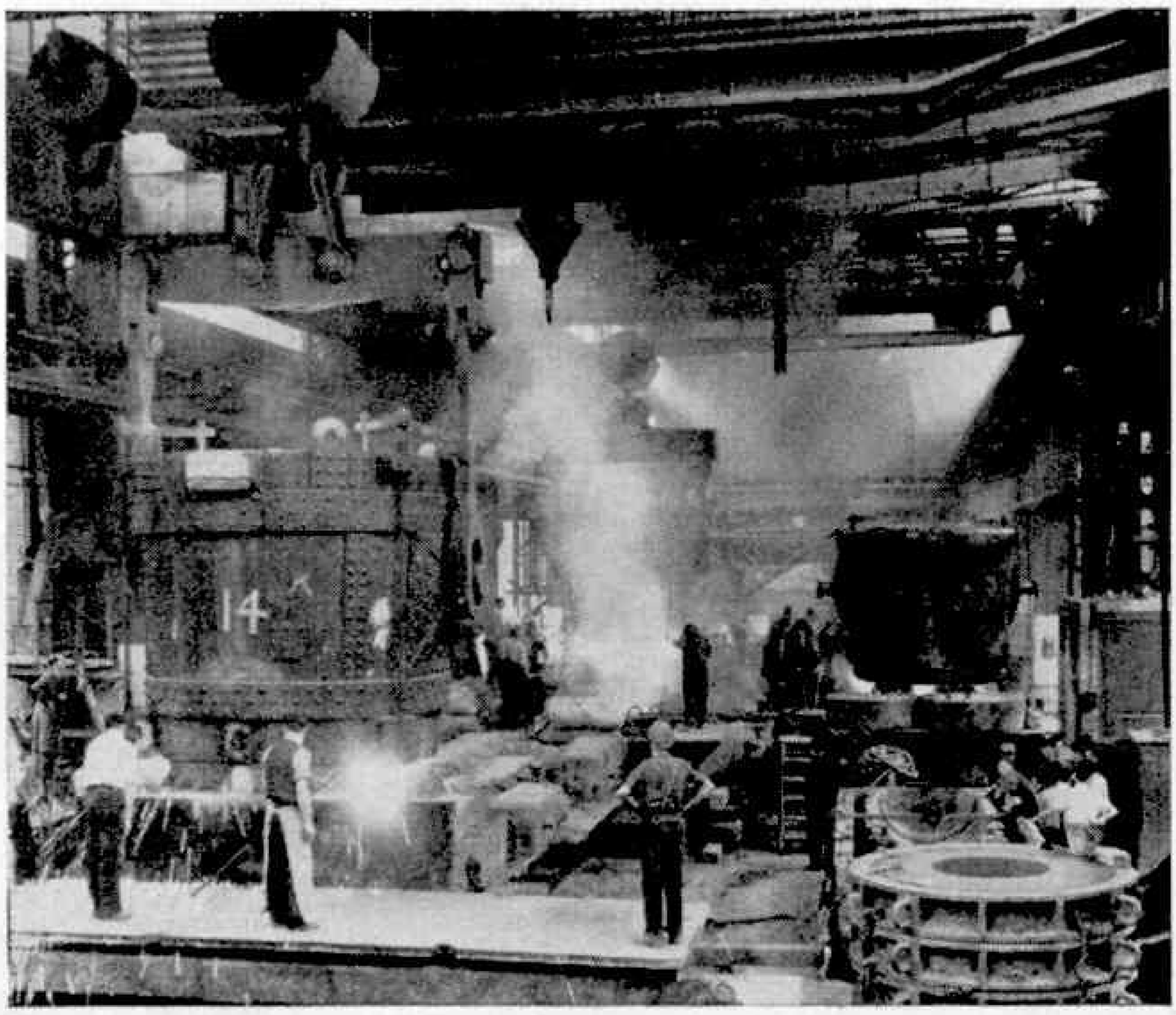
But even cross-country motorways, valuable as they are, could not satisfactorily achieve their purpose unless linked up with local motor roads serving the city centres, factory and dock areas. Means will have to be found to relieve the appalling congestion inside our cities, where the vast majority of road accidents occur.

An answer to this problem is the urban motorway, which is already a striking feature of many of America's largest cities.

In busy places like San Francisco, Detroit and Kansas City, motorways run on viaducts above street level, or in subways or underpasses below. In Stockholm the problem of traffic delays at busy street junctions has been overcome by building intersections on two levels. In Rotterdam sunken motorways carry traffic across the heart of Holland's second largest city without hold-ups in only ten or twelve minutes. This express route, which connects with the famous Maas Tunnel, is now used by 40,000 vehicles daily.

The principle of urban motorways is to distinguish the needs of main traffic, local traffic, pedestrians and shoppers, and to make proper provision for each. The motorway is entirely separate from the shopping streets where, with wheeled traffic reduced to a minimum, pedestrians enjoy the benefits of wide pavements and arcades. Special shopping areas entirely free of traffic have been created in Rotterdam, and greater street safety is

(*Continued on page 332*)



**Steel being poured into the mould in which a 142 ton shear frame casting was to be formed. Photographs by courtesy of English Steel Castings Corporation Ltd.**

# A Giant Casting

## Steel Frame Weighing 142 Tons

THE photograph reproduced alongside was taken during the production of one of the most complicated heavy steel castings ever attempted in Great Britain. The casting itself is shown in the lower illustration on the opposite page, which gives a very good idea of its size as well as of its complicated character. It was designed as a frame for a giant shear that Davy and United Engineering Company Ltd., Sheffield, built for Dorman, Long and Company Ltd., to form part of a new blooming and slabbing rolling mill plant for that firm that has been built at Lackenby, near Middlesbrough.

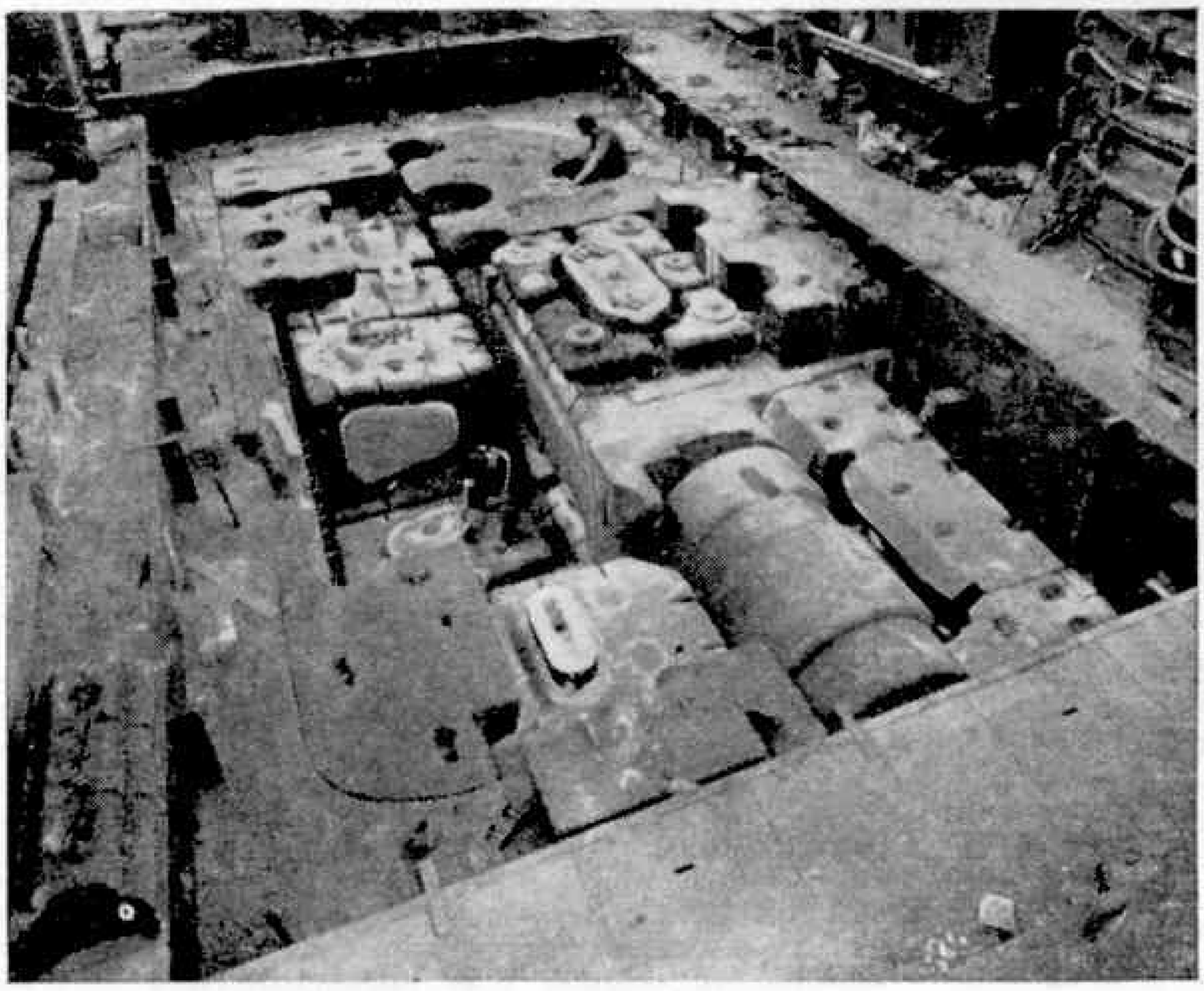
The casting was made by the English Steel Castings Corporation Ltd., also of Sheffield. Looking at the picture of it at the foot of the opposite page, readers will not be surprised to learn that it weighs as much as 142 tons, an immense mass of steel to be produced in the form of a single casting. It is about 26 ft. long and 12 ft. wide, and 8 ft. in depth. A glance at the picture also shows that in it there are many varying shapes of metal, and wall thicknesses also vary considerably. This meant that many technical problems were involved in making the frame. The possibility of building it up from two or three separate castings was considered, but it was realised that a fabricated structure of this kind would not stand up to the very arduous requirements of the shear design, one that was to be capable of exerting a pressure of 1,350 tons. It was because of this that the decision was made to make the casting in one piece, in spite of the difficulties that this would involve.

The general method of producing a casting is to build up a mould into which to pour molten steel. The interior surface of the mould of course has to be prepared very carefully, with the final shape of the casting reproduced in reverse in compressed moulding sand. The mould required for this casting was built up in a pit 35 ft. long, 17 ft. wide and 10 ft. deep. The upper illustration on the opposite page shows the mould, and a good idea of its size is gained by comparison with the figure of the man seen at work in it.

When a casting is not solid, as was the case with this example, and indeed is the case with most castings, provision has to be made for re-entrant portions and holes in the casting itself. This is done by building up what are called cores and placing them in the casting pit, with the shapes of the depressions or holes to be formed in the finished casting reproduced in moulding sand round them. In this instance there was a very complicated arrangement of 80 cores in the mould, some of which can be seen in our picture of it.

These preliminaries to the actual casting naturally occupied a very considerable time for such a large workpiece as this

shear frame. As many as 1,240 man-hours were spent in preparing the mould, with a further 600 for making the cores and fitting them into their exact positions. Then the mould had to be dried before casting took place, a process that required another four weeks. Many portable drying stoves were required for this part of the operation, and these between them burned 30 tons of coke before the mould was ready.



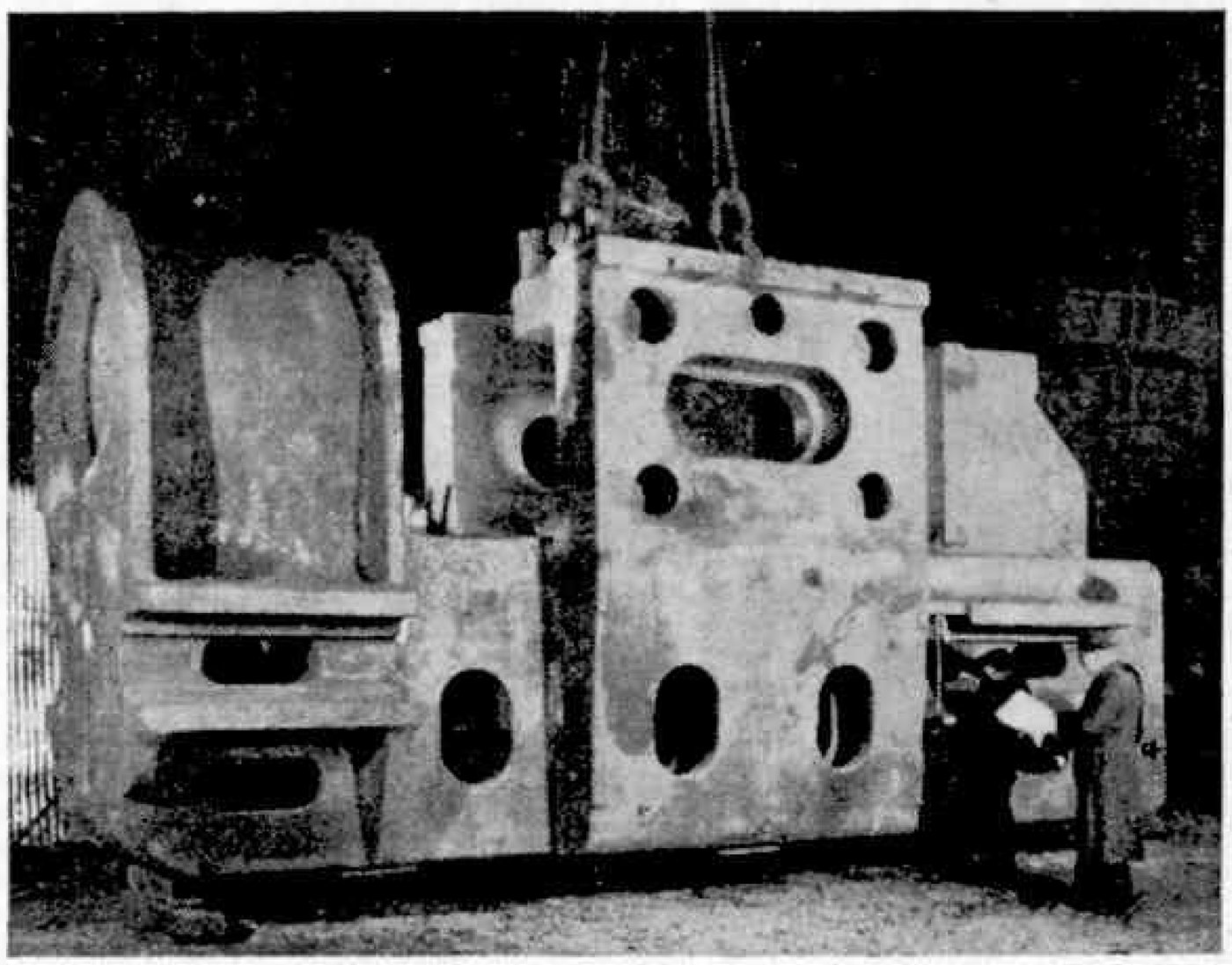
**This picture shows the mould in which the casting was made during its preparation.**

Then came the actual casting, seen in the illustration at the head of this article. Practically the whole of the steel making resources of the foundry in which the work was done were required. The bulk of the steel required to fill the mould was provided by three Siemens open hearth furnaces, which had to be tapped at the same time, so that the metal for the entire casting could be poured at once.

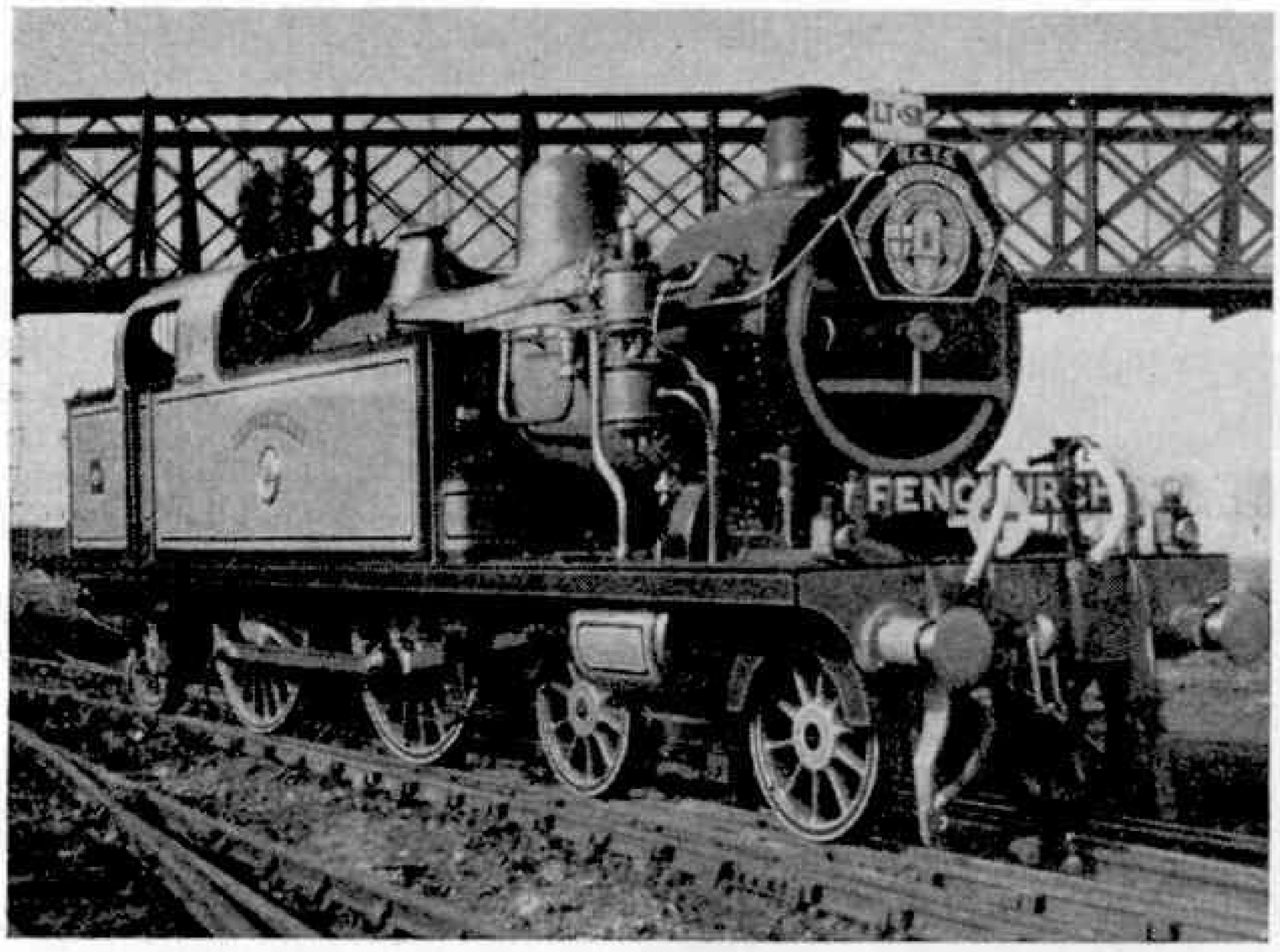
Three ladles, one of which is seen in the illustration on the opposite page, were used to pour in the steel tapped from the furnaces. Between them they teemed 198 tons of molten steel, and a further 25 tons of molten steel were added to the 21 feeder heads of the mould later. This amount is larger than the total quantity of steel in the casting itself, the difference being accounted for by parts of the rough casting that had afterwards to be removed, including metal that would well up into the tubes or risers, as they are called, through which air would escape while the steel was being poured, and that remaining in the feeder heads through which the molten steel was poured into the mould.

An enormous mass of metal such as this takes a long time to cool after solidifying, and the casting was left in the mould for four weeks before it was ready for removal. Then it was lifted by means of hydraulic jacks and electric overhead travelling cranes, after which came fettling, that is the removal of parts of the rough casting not required, and the necessary heat treatment operations.

So the casting of this enormous frame was completed, with entire success. It is seen in the lower illustration on this page, in which its dimensions are being checked. A further casting of similar design is to be supplied to Davy-United later in the year.



**The finished casting, which is 26 ft. long.**



**A Tilbury revival. L.T. & S. No. 80 "Thundersley," which has been running as B.R. No. 41966 in recent years, is here shown restored as far as possible to its original appearance in connection with the recent centenary of the L.T. & S. Photograph by R. E. Vincent.**

# Railway Notes

By R. A. H. Weight

### Electrification Decisions

It has been decided that all future electrification schemes employing overhead traction will accord with the latest 25,000 volts, 50-cycles alternating current system, which has proved successful on sections of the French Railways and also on the British experimental installation introduced in 1952 between Lancaster, Morecambe and Heysham. Compared with the 1,500 volts, direct current overhead system latterly adopted in British railway electrification, it is claimed that costs of power supply equipment, of maintenance, and power consumption will all be less, and that lighter overhead structures and overhead wires will be required. The locomotives too should have greater power. Despite the much higher voltage of the A.C. supply, the safety of the public and of railway staff will in no way be diminished.

The Liverpool Street–Shenfield lines, E.R., from which extensions will soon be completed to Chelmsford and Southend-on-Sea, will be converted to the new A.C. system, which it is intended to employ on electrification of main trunk routes between Euston, Crewe, Birmingham, Liverpool and Manchester; King's Cross, Doncaster, Leeds, and possibly York; Chelmsford to Ipswich, including certain coast branches; and suburban and residential services radiating from Fenchurch Street, Liverpool Street, King's Cross and around Glasgow.

S.R. 660-volt third rail method of conduction will continue, as it would be very costly and delaying to future extension plans if any radical alteration took place now. It is not proposed at present to alter the existing electrification systems on the Manchester-Sheffield-Wath, Liverpool-Southport, Tyneside, Wirral, Euston-Watford or London Transport lines.

The first electric train in the world to be fitted with a germanium rectifier, for converting alternating current from the overhead wire to direct current for driving traction motors, has been on trial in London and Lancashire in conjunction with the British Thomson-Houston Company.

### Southend Centenary Celebrations

As announced editorially some months ago, the Eastern Region at the beginning of March celebrated the centenary of the opening of the railway between London and Southend-on-Sea—partly following a route differing from the present direct one. Indoor and outdoor exhibitions were held. At the latter the famous Gresley 4–6–2 *Mallard*, Britannia 4–6–2 *Robin Hood*, electric locomotive No. 27002, class 4 2–6–4T No. 80080 and diesel No. 12134 were on view, with an array of modern coaching stock, a diesel passenger unit, track maintenance machinery and so on.

*Thundersley*, the last remaining London, Tilbury and Southend Railway's 4–4–2 passenger tank locomotive, splendidly restored to its green livery which I knew well as a boy, hauled two trains. One was a special conveying invited guests, and the second carried a subsequent party organised by the Railway Correspondence and Travel Society. The first coach of each special train was an L.T.S. 8-compartment bogie third built in 1910, restored to original teak appearance and lettering as familiar before the former Midland Railway took over that busy little line.

### Additions to Locomotive Stocks

Class 5 4–6–0s built at Doncaster are reaching the Scottish Region, including No. 73124, allocated to 67A, Corkerhill, Glasgow. Another 2–10–0 for 36A, Doncaster shed, was No. 92076, followed by Nos. 92077-8, 18A, Toton.

The new class 4 2–6–4T, No. 80131, has gone to 33A, Plaistow, not King's Cross as first announced, with Nos. 80132-4. No. 3404, 0–6–0PT, from the Yorkshire Engine Company's works, has been added to W.R. stock; the previous four, 3400-3, went to 88B, Cardiff East Dock.

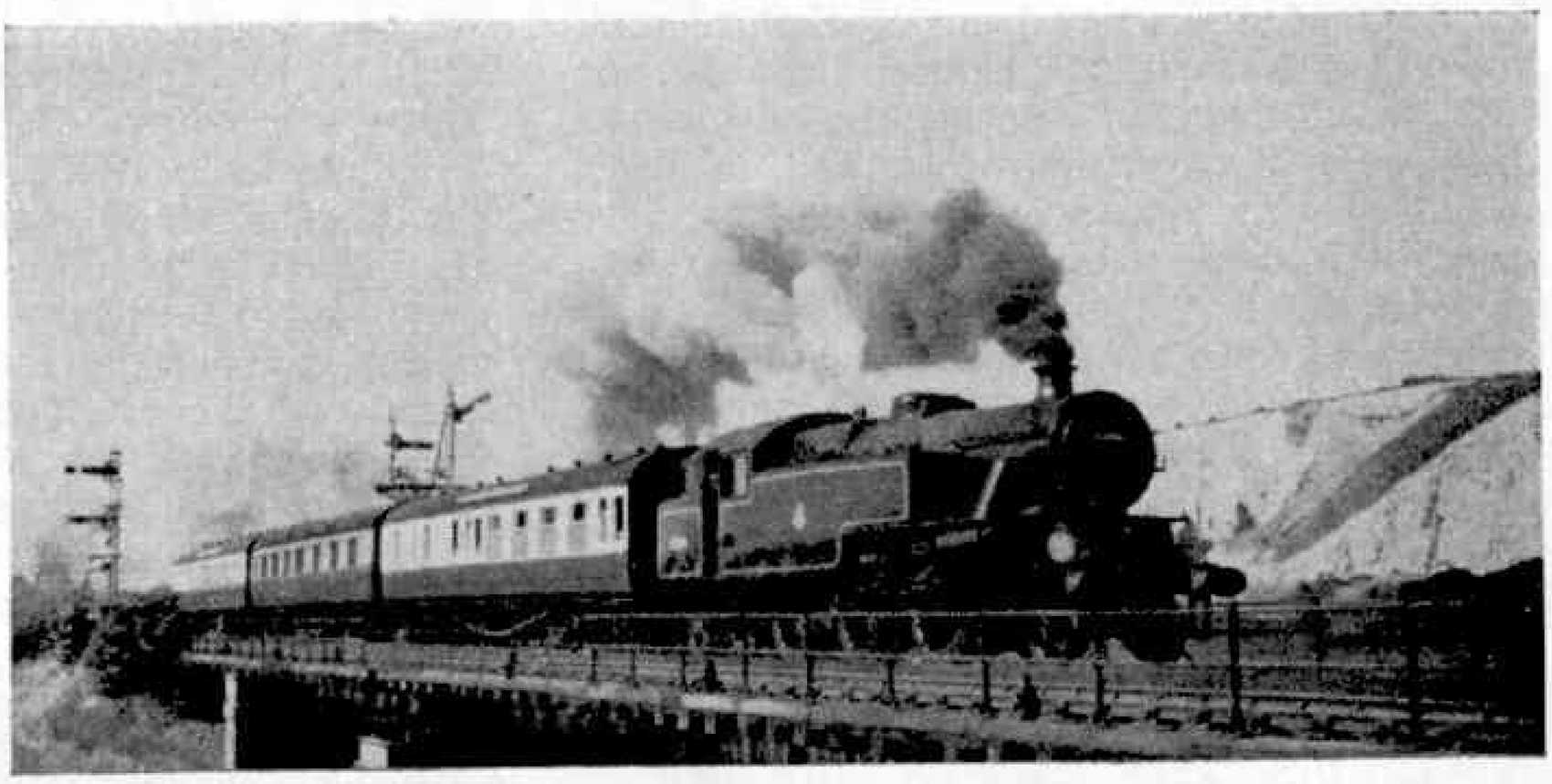
More 350 h.p. diesel-electric shunters for Scottish service include No. 13211, allocated to 62A, Thornton; Nos. 13212-4, 65C, Parkhead; and No. 13215, 65B, St. Rollox. For work further south, Nos. 13241-3 were destined for 50A, York, and Nos. 13298-13302 for 30A, Stratford.

### Through Trains via Banbury and Oxford

The W.R. north main line, carrying over parts of its course fast trains between London, Birmingham and Chester, is traversed through Banbury and Oxford by a number of useful through long distance services in which Southern and Eastern Regions share. These include trains between Birkenhead and Kent and Sussex towns; Birkenhead, York and Bournemouth; York or Sheffield and Swindon or S. Wales; Birmingham and Weymouth W.R., Wolverhampton and Portsmouth, etc. Southbound they diverge at Didcot N. Junction either westward towards Swindon or eastward to Reading. Thence they are routed, if for Hampshire, via Reading West and Basingstoke, and if for Sussex and Kent, via Reading General to the S.R.

S.R. locomotives run over W.R. metals to Oxford from Bournemouth. W.R. engines go farther north at night to Leicester, Cen., from Swindon. Week-end or summer Saturdays' rosters send W.R. engines with Midlands trains to Redhill, Portsmouth or elsewhere on the Southern, and E.R. ones to Swindon.

Travelling recently from Leamington Spa to Hastings in the through portion from Birkenhead-Chester-Shrewsbury was an interesting experience. I was armed with a gradient profile and a map indicating the many stations, junctions and other lines visible. To Reading the engine was No. 5906 *Lawton Hall;* the Southern provided B.R. class 4 2–6–0, 76061, to Redhill, Surrey, which gave us the fastest running, rebuilt D1 No. 31492 to Brighton, L.M. type 2–6–4T No. 42082 to Eastbourne and another D1 4–4–0, No. 31743, to Hastings. There were three reversals of direction!



**A London Midland type 2-6-4T in Southern Region service crossing Southerham Bridge over the Ouse, near Lewes, on a Birkenhead-Hastings train. The photographs on this page are by Mr. S. C. Nash.**

Running as a separate train from Redhill, the Kent portions went forward behind Schools 4–4–0 *Christ's Hospital.*

### Passenger Rolling Stock Colours

A few named expresses on the Western Region are to have chocolate and cream carriages; the Southern is to return to green, which will be the livery for diesel and electric coaches wherever employed. Otherwise the standard B.R. painting is to be a maroon shade of red reminiscent of former L.M.S. practice.

### Fast Scottish Express Running

I went down from Euston to Rugby in March by the *Midday Scot*, when the Crewe driver of the large 4–6–2 *City of Birmingham* made a spirited effort to keep the very fast 80-min. timing for the 82¼ miles start to stop. The load was 12, including a covered carriage truck, about 415 tons gross, and we were banked out of Euston nearly to Camden Motive Power Depot by a 2–6–2T up the initial sharp rise. Thereafter on the comparatively easy grading, though largely rising, 62-68 m.p.h. was maintained up to Tring. Then an average of 74 with a maximum of 81 over the ensuing 15 favourable miles took us through Bletchley, 46¾ miles in 45¾ min., the quickest I have recorded.

A long slowing owing to track repair was a bad hindrance just before Wolverton, but the last 22¾ miles from Roade to Rugby were covered in 20¾ min. and got us to the latter station less than a minute late.

A friend's log of the southbound *Queen of Scots*, a 9-car, 380-ton express, shows that after a late start from Leeds and some subsequent slacks, 44 miles from passing Newark to a slow passing of the south end of Peterborough station were reeled off in 35½ min., making the train almost punctual. After passing Stoke Box, Lincs., at the top of a long rise at 59 m.p.h., the maximum attained near the foot of the famous descent towards Peterborough was 92-93, maintained for quite a distance. The engine was A1 No. 60133 *Pommern*, on the usual Leeds, Copley Hill, working and booked non-stop from Leeds to King's Cross.

### Some Railway Summer Enterprises

In addition to the popular land cruise train, which will be running again this season from coastal resorts in N. Wales on a circular tour of more than 150 miles, a new *Cambrian Radio Cruise* special will operate from Llandudno daily over a specially scenic route, staying for 2 hours at Aberdovey. A radio commentary on the passing scene, individual armchair seats and a cafeteria will be among its attractive features.

The W.R. narrow-gauge Vale of Rheidol line between Aberystwyth and Devil's Bridge will be catering for tourists again this summer. Diesel trains with their large side and end windows affording fine views have also been introduced in N. Wales.

The success last year of the Car-Sleeper special night service between King's Cross and Perth has led to more frequent running this season. It carries motor cars in covered vans, and their passengers who wish to travel quickly to a holiday or touring area in sleeping cars or ordinary coaches.



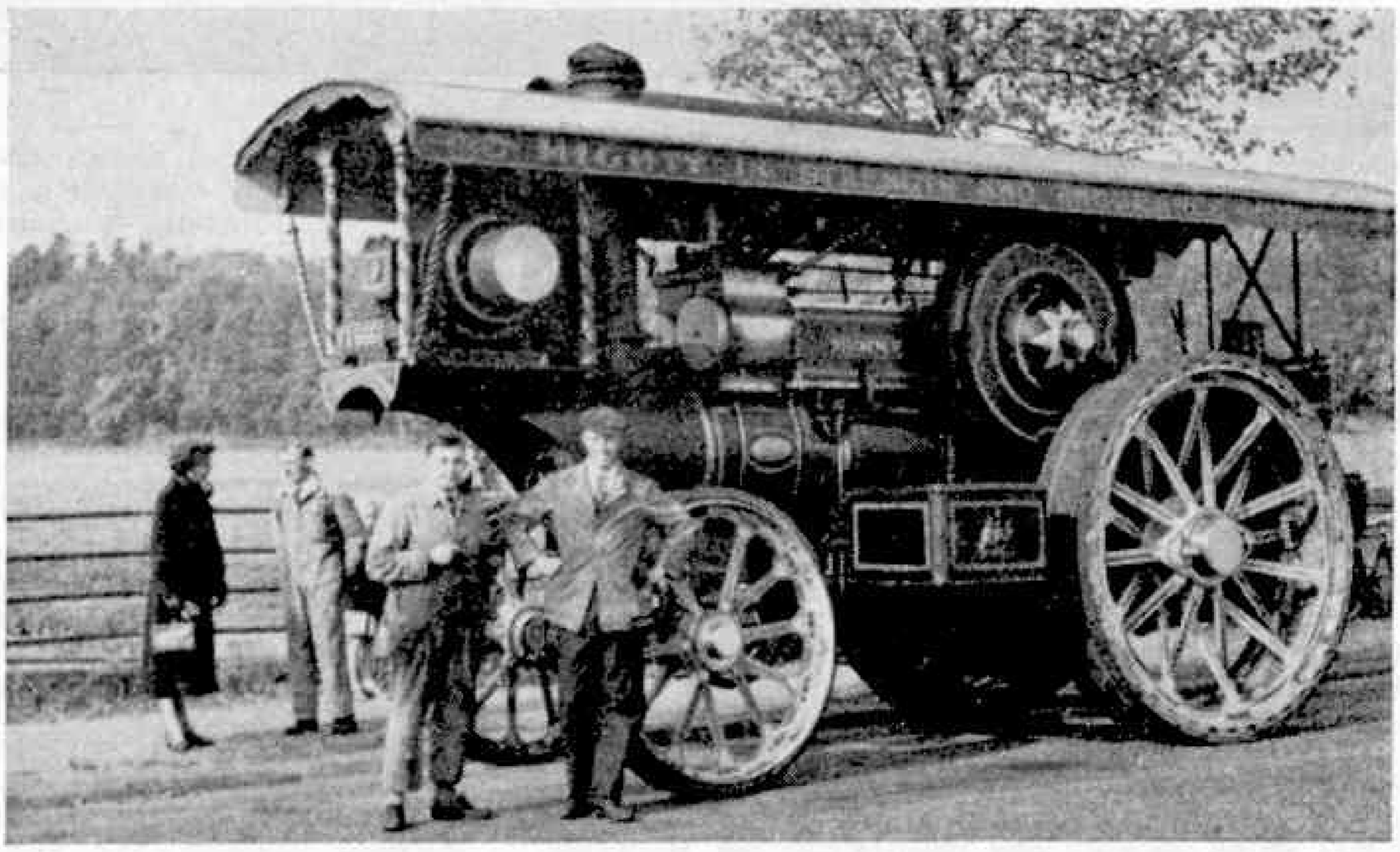
**Western Region 2-6-0 No. 5322 running through on the S.R. near Gomshall with a train from Birmingham to Eastbourne and Hastings.**

# Traction Engine Journey

By John Crawley

FIRST of all, let me say that this is a story of a journey from Yorkshire with a Fowler showman's Engine and is not told with the idea of creating the impression that we did anything unusual. In days gone by this trip would most probably have been done very nearly in one day—not three—but then the drivers knew what they were about, and that makes all the difference. So here then is our story.

I have always admired the steam traction engine used by our travelling showmen, and so I decided that I would like to buy one with a view to restoring and using it in Rallies. It sounds very simple until you try and find an engine with a good fire-box. Agricultural engines are easy, but it took me over 2,000 miles looking around England in the course of my travels before I heard of a showman's engine, No. 15657, and bought it.



**"Kitchener" stops for tea. The author is in the centre, with the water diviner behind him and Harry "Press On" Kitson on his left.**

It was not until I started to plan such a trip as I had in mind that I realised the number of items that are required—Cylinder oil, engine oil, paraffin for lamps in case we get caught after dusk on the road, spanners, gland packing, spare gauge glasses and washers, two buckets, hammer for breaking coal, a very long length of garden hose pipe just in case—these are only some of the bits and pieces.

At last everything was arranged, and the crew completed. Peter Harding was to be in charge of the car and trailer during the journey, and his assistant Cyril Norman was to map-read possible sources of water in advance. My co-driver, Harry Kitson, was the last to be picked up as he lives some ten miles from Bedford, and then we ran north, with 5 cwt. of coal in the trailer, to Conisborough, in Yorkshire. There our engine stood, *Kitchener*, Fowler 15657, built in 1920, A Class R3 Long Box, Compound Road Locomotive. The next ten minutes I spent showing her to the crew and I am sure that if we had been taking delivery of a new Rolls-Royce, we could not have felt more proud of her as she stood awaiting her fate at the hands of a bunch of amateurs.

The hose pipe was soon connected and filling her tanks commenced, while the lighting of the fire was put in hand. Then came the job of oiling up and coaling. Into the trailer we placed the canvas engine covers, governor belt, flywheel to dynamo belt and a box containing 40 odd bulbs for the engine's canopy. By 10.40 we were ready to leave and after bidding farewell to Mr. Harry Hollingsworth, *Kitchener's* late owner, we climbed aboard and our journey commenced.

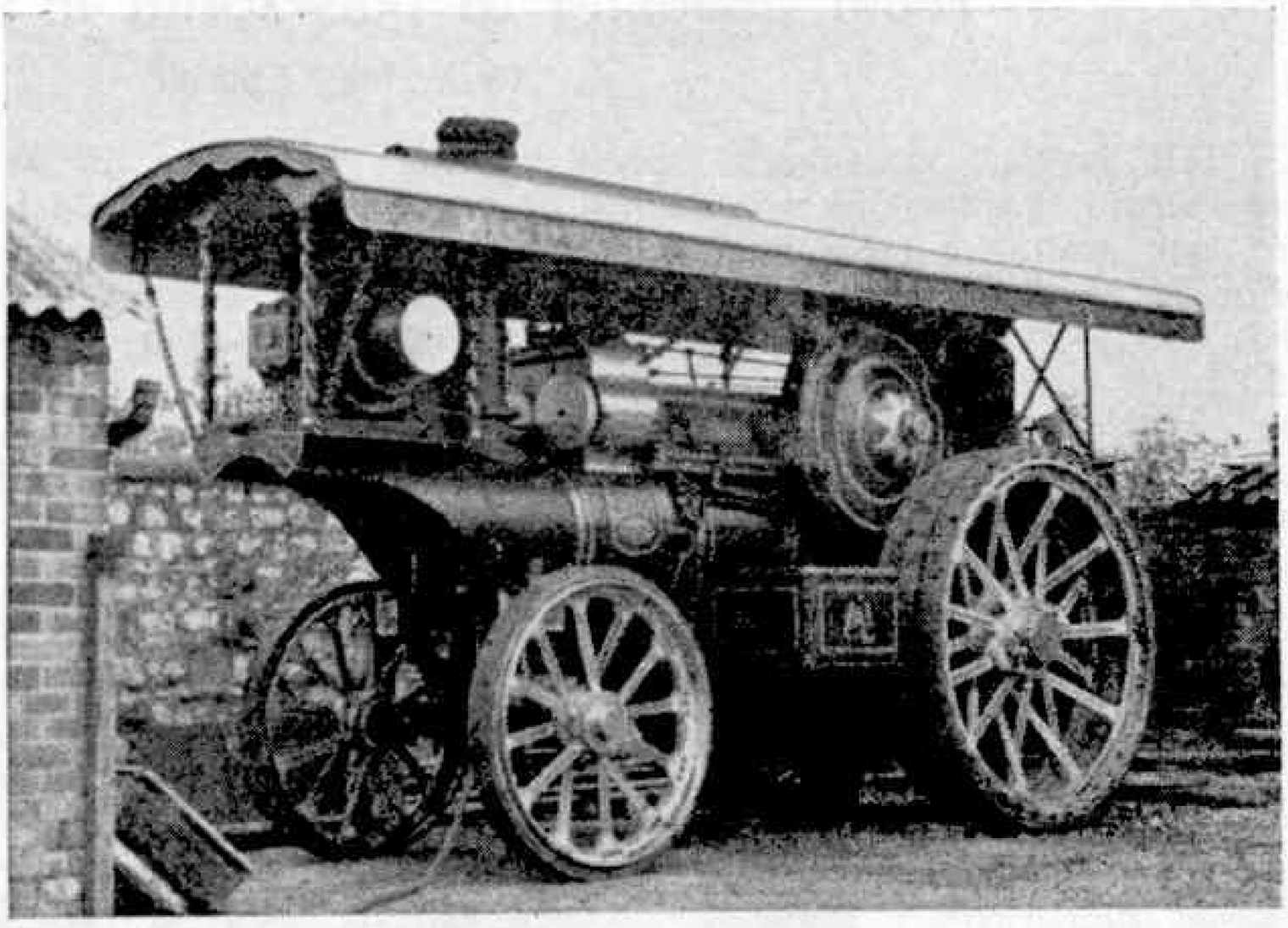
The first town to be negotiated was Rotherham, which we cleared in the hour—this being roughly seven miles from Conisborough.

The next stop was at Whiston, where water was taken, as it was at Killamarsh, Clowne and Pleasley. But at Pleasley we experienced our first set-back. Upon undoing our suction hose we found, to

our dismay, that it had parted in the middle except for the inner and outer wires which were still intact. Oily rag was bound around the damaged area which, to our joy, worked well enough if held tightly pushed together, and we pressed on through Mansfield.

Soon we began to think about water again. As time went on, it was becoming increasingly obvious that because of the current drought we were going to experience some difficulty in finding it—and dusk was getting near. Eventually we joined A 614 north of Arnold and there pulled into a petrol station to take on water from a hose with a nozzle of some ½ in. diameter, while I went to look for a suitable place to leave her in until the following week-end. Here indeed we were very lucky, as we came across Mr. Hammond, of Arnold, who is a very keen engine man, owning his own ploughing tackle together with a pair of BB Compounds.

"Leave her at my place, we'll see she is all right," he said, and set off in his car, followed by *Kitchener*, with our car and trailer bringing up the rear. She was soon bedded down, whereupon we were all invited into the farmhouse and Mr. and Mrs. Hammond gave us a hearty welcome and a superb meal.



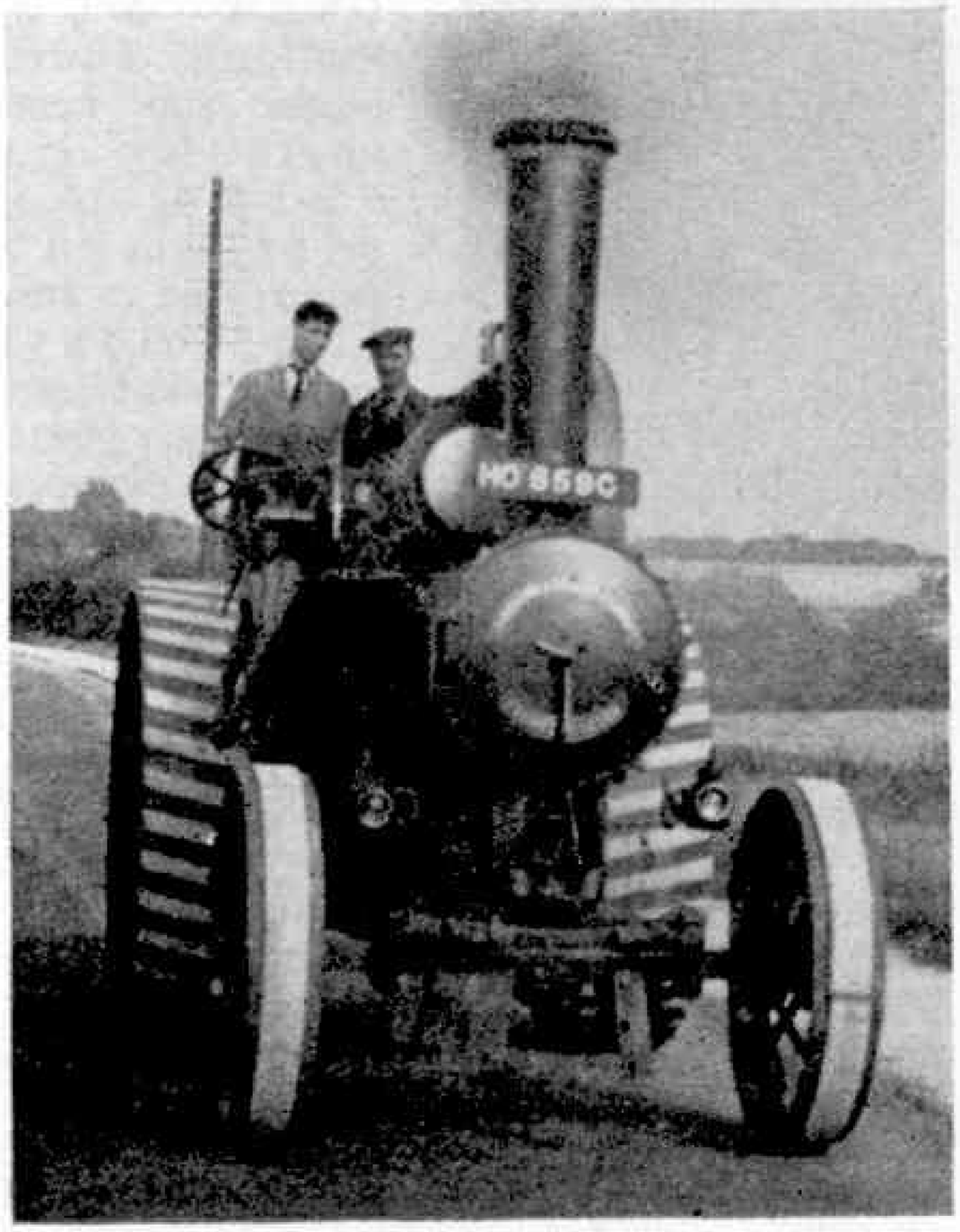
**Filling "Kitchener's" tanks while preparations are made for lighting the fire before starting on the trip described in this article.**

Next week-end came round quickly enough, and when we arrived at Arnold we had a fine surprise! There *Kitchener* stood, turned round, with steam gently hissing from the safety valves, tank and bunker filled and Mr. Hammond busy oiling up. There was nothing for us to do except bid farewell to a very generous friend and climb aboard.

So we were on the road before 8 a.m. We cleared Nottingham without trouble, waving to many of the showmen who were on their way from the Goose Fair.

The first stop was at Ruddington, 11 miles from Arnold, where water was taken before travelling a further 16 miles to Rothley, where we coaled up and replenished our tanks. Shortly after leaving Rothley, we overtook John Beeby and his son Mick on Fowler Traction 14600, on their way from Rempstone to Market Harborough.

We were clear of Leicester without trouble by 1.30, (*Continued on page 332*)



**Another Fowler engine, No. 14600, met by the author on the road to Market Harborough.**

# New Zealand's Man-made Forests

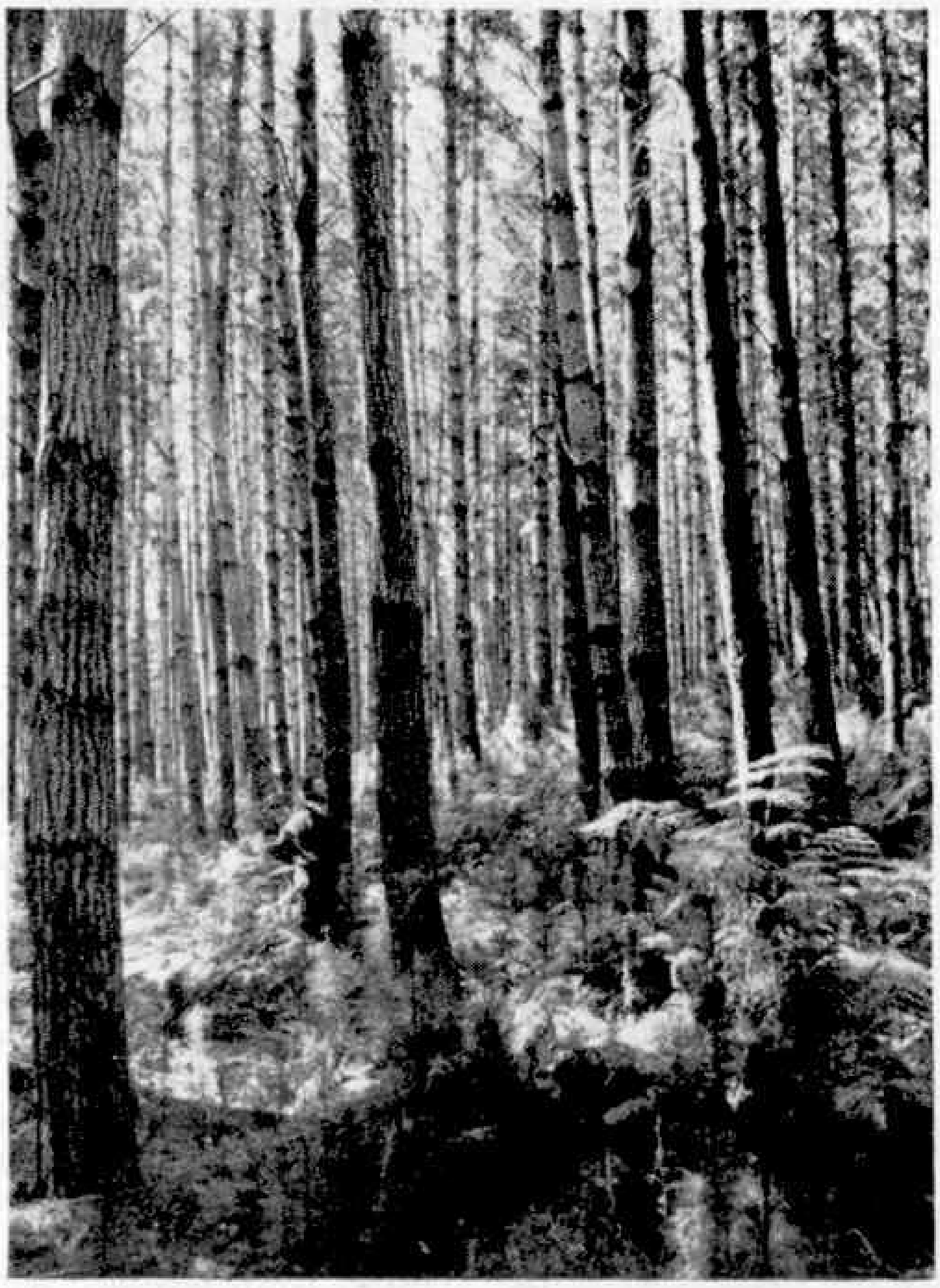
## From Seedling to Newsprint in 25 Years

By V. May Cottrell

THE largest man-made forest in the world, comprising thousands of acres of tall, standing trees, is the Kaiangaroa Forest, in the centre of the North Island of New Zealand. It is 50 miles long and 20 miles wide. But in spite of its size, it is only a part of the total area of man-made forests in New Zealand. These cover 890,000 acres, an area more than that of such English counties as Wiltshire or Cornwall.

When motoring through the vast areas that New Zealand's man-made forests now cover, it is hard to believe that a brief 50 years ago this great afforestation scheme was merely an idea in someone's mind. But, like many other great undertakings, it had small and apparently insignificant beginnings that gradually grew and expanded into large scale operations. The whole scheme required long-range vision and careful planning, faith in the ultimate success of the project, and boundless enthusiasm.

While native forest trees take from 200 to 300 years to come to maturity, various kinds of pine, larch and Douglas fir—none of them native to New Zealand—are ready for milling in the incredibly short period of 25 years. Because of the favourable climatic conditions and soil content, these softwood forests can be grown more quickly, and hence more cheaply, in New Zealand than in almost any other part of the world. Consequently, the Dominion is assured of the development of an extensive export trade in timber, woodpulp, newsprint and other forest products that will, in this respect, be comparable shortly to her wool and dairy products and frozen meat trade overseas.



A good stand of pines in a New Zealand forest.

Before the coming of the white settlers in the early 1800's a large portion of New Zealand was very heavily wooded. The early Maoris hollowed out their impressive war canoes from giant totara trees, and hewed and carved this and other native woods for their meeting houses. Later the Royal Navy discovered that New Zealand kauri made the best spars for its ships. As settlement progressed in the new colony, timber was taken from the great primeval forests to build homes, fences, bridges and public buildings, and the timber trade with Australia flourished.

But to make more land speedily available for farm settlement, the great bulk of this potentially valuable timber was cut down and burnt quite early in New Zealand's history. Because of this wholesale destruction, and the then unavoidable waste of the timber resources, it was soon realised that there would be a serious timber shortage in the not far distant future. Consequently, the New Zealand



**Felling trees with a chain saw in the Kaiangaroa Forest, in the North Island of New Zealand.**

Government took over much of the remaining native bush country as forest reserves, and also began planting operations with imported species of various kinds at the end of the last century.

These experimental plantings continued until the 1920's, and by that time sufficient experience of the most suitable species and planting sites had been gained to warrant a huge expansion of planting by the State and also by afforestation companies and private individuals. In the peak year of this activity some 50,000 acres were planted. This extensive planting of forest trees continued until about 1935, and has been followed by smaller scale plantings ever since. The result is that New Zealand now has a large and valuable forest estate, most of which covers land unsuitable for farming.

As part of a comprehensive scheme for the reclamation of 290,000 acres of sand dunes, the State Forest Service is establishing an ever-increasing number of trees on the protective zone.

It is estimated that the annual growth of timber in the State Forests alone is in the region of 65,000,000 cubic feet. This represents approximately 400,000,000 board feet of timber, or only a little less than the current total yearly consumption. This, in conjunction with the company and privately-owned forests, is sufficient to meet all New Zealand's needs and to provide a considerable exportable surplus as well.

With such large areas planted in trees the fire hazard is naturally very great during the dry season, and there have been some large and very destructive forest fires in New Zealand at various times. To combat this menace an efficient fire-fighting service is maintained by the State. In the larger exotic forests look-out cabins are located, manned by fire-finders and equipped with radio and telephones. Trained crews with modern equipment can be brought into action at a moment's notice. They are controlled through a radio network. In addition to this aerial patrols operate during each fire season in the large and important Rotorua area.

So great is the havoc that can be caused by one cigarette butt thrown carelessly from a passing car, or by a camp fire not fully extinguished, that newspapers and magazines carry large *Keep New*



**A forest look-out.**

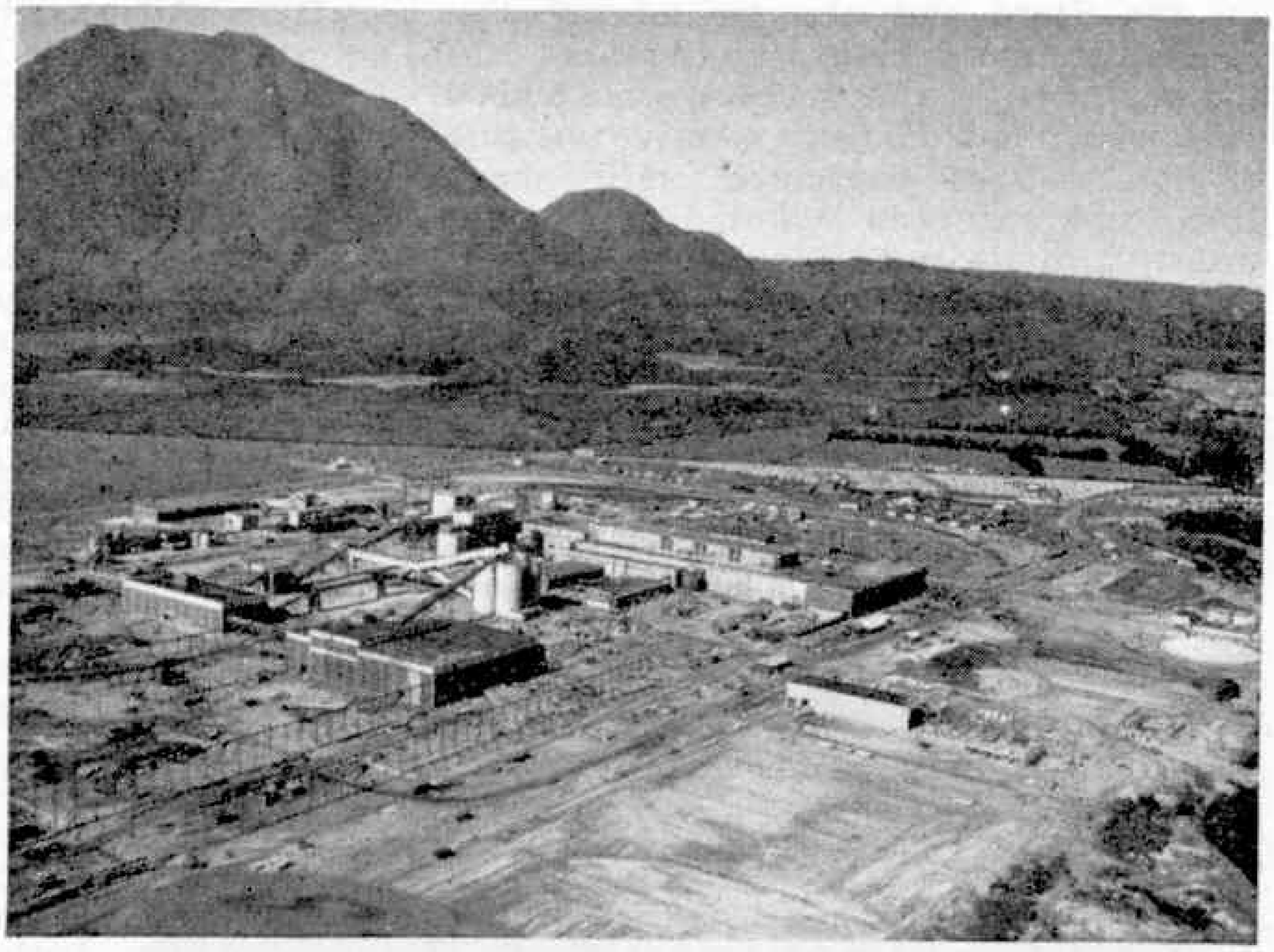
*Zealand Green* advertisements, and posters are displayed and warnings given constantly during dry spells from all radio stations. Near the forests themselves giant signs that can be read half a mile away demand the utmost care from the public, while the lighting of fires in these areas is strictly forbidden.

Anything more terrifying and destructive than a great forest fire can hardly be imagined. In my childhood our home was surrounded on all sides by dense virgin bush. Those early experiences of raging bush fires can never be erased from my memory, nor can I ever forget the choking, blinding smoke, when we were obliged to wear wet cloths over our faces in order to breathe at all. We were, however, more fortunate than many of our neighbours, who lost everything. For, though our home was threatened frequently —and was even alight in several places simultaneously on more than one occasion — we managed to save it by means of a bucket brigade.

Ten years ago there was a widespread and very destructive fire in the pine forests near Taupo. After viewing the desolation wrought by this fire I was astonished, on a return visit, to see how quickly regeneration had taken place. It is this speedy self regeneration that is such a marked feature of the species planted, which once they are established, assures a crop every 25 years without the trouble and expense of re-planting. All that is required is thinning to assure sturdy growth.

In connection with this great new industry it is interesting to note that the axe and the cross-cut saw have been largely superseded by the power saw. Consequently, felling trees is a much quicker and far less arduous job than formerly. The average time required by this method is one minute. Some 400 trees—a whole acre of forest—can be brought down in a single day. The trees are cut level with the ground and the cleared area is left to regenerate and will again be ready for milling in 25 years. The picturesque bullock wagon, with its slow-moving but powerful beasts, has long since given place to the tractor for hauling timber.

In the experimental stages of afforestation activities, many varieties of exotic trees were planted with varying degrees of success. But by far the most satisfactory of these was the insignis pine, which in its natural state is confined to the limited area of the Monterey Peninsula in California. This tree adapts itself in a truly remarkable manner to New Zealand conditions and has fully justified its widespread use for afforestation. It has been the mainstay of all planting, and about 500,000 acres have been established with it, or over 60 per cent. of the acreage of all species planted. It was first introduced by settlers in the 1860's, mainly for shelters. But it makes excellent timber for housing and other building operations, comparing favourably with rimu, one of the best native woods.



**The Tasman pulp and paper mills at Kawerau, pictured in course of erection in 1955.**

The woodpulp and newsprint industry is only in its infancy in New Zealand as yet, but it is clearly destined to attain immense proportions in the near future. The year 1955 has been an outstanding one in her history because of the opening

(*Continued on page 314*)

# BOOKS TO READ

*Here we review books of interest and of use to readers of the M.M. With certain exceptions, which will be indicated, these should be ordered through a bookseller.*

### GATEWAY TO THE CONTINENT

By E. W. P. Veale (Ian Allan, 10/6)

The title of this book has been adopted from the wording on a well-known barrier sign at Victoria Station, London, that no doubt many readers have seen. It is quite appropriate to this account of the development of the Continental Boat Train services between London and the Channel coast. The story does not stop there, however, but necessarily it takes in the steamer services associated with this traffic and the development of the Channel packets plying between Great Britain and Continental ports.

For many years there was fierce rivalry between the companies principally concerned with the Continental Boat traffic. These were the South Eastern and the London, Chatham and Dover Railways. Their respective Chairmen were personal as well as business rivals, but the interests of the Companies were combined in 1899, under a Joint Managing Committee, to form the South Eastern and Chatham Railway. This became part of the former Southern Railway, continuing as an important component of the Southern Region of British Railways in 1948. So, too, did the L.B.S.C.R., which maintained the Newhaven service.

The development of different routes over the years, via Folkestone, Dover, Queenborough, Port Victoria, Gravesend and Newhaven, and the building up of the train services for Continental traffic are described. Contemporary writings are drawn from at times to give an idea of travel conditions in various periods. In addition, as one might expect, the scheme for the Channel Tunnel, which has had recurrent spells of prominence, is given attention.

Clearly the author, who had close family connections with one of the original companies, is an enthusiast for his subject and he presents a good overall picture of Continental Boat Train services rather than a lot of detail about engines and trains themselves. The illustrations are plentiful and interesting and for the most part well reproduced.

### CAMP AND TREK

By Jack Cox

(Lutterworth Press, price 12/6)

This book by the Editor of the *Boy's Own Paper* is a companion volume to *The Outdoor Book* reviewed in the August 1954 *M.M.* and, like that work, is concerned with the varied aspects of rambling, camping and exploring. The methods recommended and the advice given follow the same general pattern as the earlier book, and are the result of recent work in the field by teachers, youth leaders and small parties of senior boys and girls in all types of schools.

There are chapters on the technique of camp and trek, choice and care of equipment, trekking by cycle and by water, weather lore, bird and animal watching, and underwater exploration. The less romantic but very essential matters of food and cooking also are dealt with, and there is a very useful supplement of recipes used at lightweight camps. Another good feature is an illustrated summary of different types of tents of proved value.

An abundance of excellent line drawings and half-tone illustrations add much to the interest of the book.

### FLYING WINDMILLS

By Frank Ross, Jr. (Museum Press, 12/6)

In this history of the helicopter, the author goes back to the 15th century designs of Leonardo da Vinci, some of which are said to have been built and flown successfully. So through the centuries, sketching briefly the helicopter experiments of Sir George Cayley, W. H. Phillips, and others, the author comes to the 19th century. Then France was the "main workshop" of helicopter study and experiment, and America also was the source of some startling ideas in helicopter design. Many of the fantastic aircraft that made their appearance in these countries are described and illustrated. Even that famous inventor, Thomas A. Edison, had a shot at the subject, but eventually decided that the solution of helicopter flight must await the invention of a suitable engine.

The first substantial advance in the development of a really successful helicopter was the invention of the rotary wing machine called the Autogiro, by the Spanish engineer, Juan de la Cierva. We read of his many setbacks in perfecting his design, and of how eventually success crowned his efforts. The Autogiro was shown at the Hendon Air Pageant in 1926 and was a sensation, and within a few years patents for its construction had been obtained by the United States and several European countries.

The Autogiro was not a true helicopter, however, as its horizontal rotor blades were employed merely to obtain the necessary "lift," and were not connected to the aeroplane's engine. The engine drove a front propeller, and in this way provided the required forward motion.

A few years later, in Germany, there appeared the Focke-Achgelis, or FA-61, which has become recognised, says the author, "as the world's first practical helicopter." It had twin three-bladed rotors that rotated in opposite directions and were driven, by means of shafts and gearing, by a 160 h.p. engine. The story of the development of this machine by its inventor, Dr. Heinrich Focke, a leading German aviation expert, is exciting, and so also is the account of the invention of the now famous Sikorsky helicopter by Igor I. Sikorsky, in the United States. These two types were the forerunners of the modern helicopter. The story of subsequent developments and a survey of the different types of helicopter now in service bring this fascinating history up to date.

There is an interesting account of the many and varied uses to which these ungainly looking machines are put, and a final chapter considers the future development of the helicopter.

The book has many excellent half-tone illustrations.

### THE LOCOMOTIVES OF THE GREAT WESTERN RAILWAY PART 4

(R.C.T.S., 10/6)

This is the most recent addition to the series of Parts published by the Railway Correspondence and Travel Society dealing with G.W.R. Locomotives. As it is concerned with the 6-wheeled tender types of the company, it covers a large number of engines and a wide number of variations of the different classes coming within the 6-wheeled category. Even so, only three wheel arrangements are involved—2–2–2 singles, and 2–4–0 and 0–6–0 coupled engines, all of them dating back very many years. The 0–6–0 tender type is still of course represented among Western Region locomotives.

As is usual with R.C.T.S. publications, an immense amount of information is included in the book. Variations in individual classes and engines are recorded, with details of numbers, dimensions, boilers and so on. These include changes following the use of many G.W.R. 0–6–0s on war service overseas.

The illustrations are full of interest, most of them being half-tone reproductions, with the frontispiece in colour.

The book is extremely good value at 10/6 per copy, including postage, and can be obtained from the Hon. Publications Officer, R.C.T.S., 18 Holland Avenue, Cheam, Surrey.

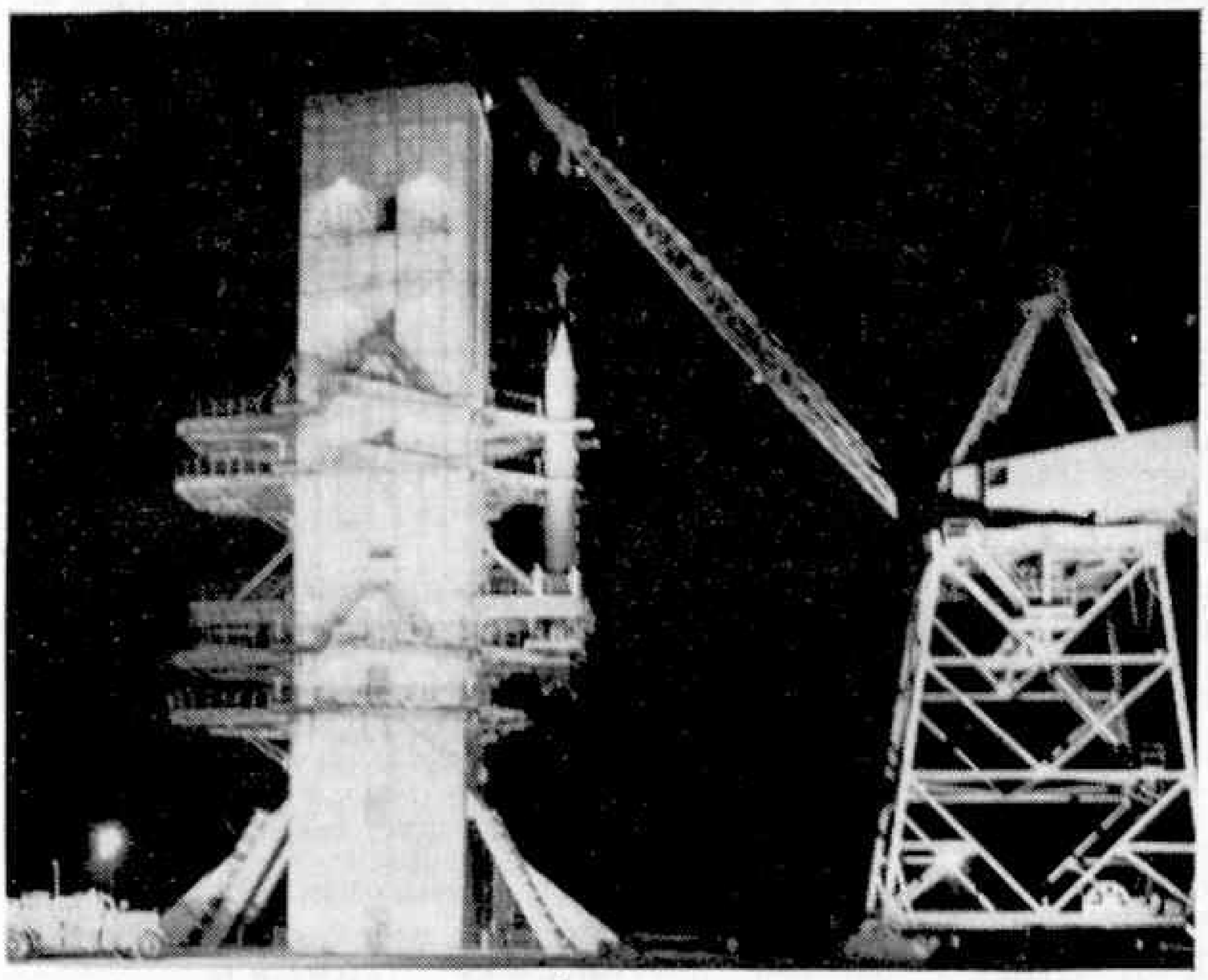
# Air News

By John W. R. Taylor

### Giant Rocket Test Stand

The picture on this page of the U.S. Army's new rocket test stand at Redstone Arsenal, Alabama, gives a good idea of the amount of time and money being devoted to "push button" weapons in America. As tall as a 15-storey building, it dwarfs even the huge Redstone rocket that is being lowered into position, for a night test, by a crane that is itself quite impressive.

Until recently, no details had been given of the Redstone, which is a medium-range guided weapon, larger than the wartime German V-2 and designed, like the latter, by Dr. Wernher von Braun. Except for its pointed nose-cone, it is a simple cylindrical missile with very small fins and has been designed for transport by air to U.S. bases anywhere in the world.



**The U. S. Army's new rocket test stand at Redstone Arsenal, Alabama, seen in the glare of searchlights. The huge Redstone guided missile is being placed in position for a night test. U. S. Army photograph.**

### Dates to Remember

This year's S.B.A.C. Flying Display and Exhibition will be held at Farnborough from 3rd to 9th September inclusive. As in previous years, the public will be admitted on the last three days, and there is no need to tell regular readers of the *M.M.* that they will see a wonderful flying programme by Britain's leading test pilots in the world's fastest and finest aircraft.

### Russia's Tu-104 Jet-Liner

The arrival of the Russian Tu-104 jet-powered air liner at London Airport on 22nd March last caused far more surprise than it should have done. The last two or three May Day and Aviation Day fly-pasts by the Red Air Force over Moscow have produced a succession of new fighters and bombers of first-class design, and there was no reason to believe that Russia was trailing behind Britain and America in the development of civil jet-liners.

The Tu-104, designed by A. N. Tupolev, is a transport version of one of the latest Soviet bombers, known in the West by the code-name of Badger. The swept wings are unchanged except in position, being low instead of mid-set, with bogie main undercarriage units which retract into nacelles on the trailing edges. The crew cabin also seems to be the same as on the bomber and even retains the bomb-aimer's windows and radar bomb-sight blister under the nose.

The rest of the fuselage is new, and the aircraft that visited London had luxury seating for up to 46 passengers. It was probably a prototype, because people who went inside it said that its cabin pressurisation system works only up to 33,000 ft., above which oxygen equipment is used. But the Tu-104 is in full production for the national airline Aeroflot and will normally carry 50 first-class or 70 tourist passengers, plus a crew of six, at a cruising speed of 500 m.p.h.

Key to the Tu-104's performance is the Mikulin M-209 turbojet, which develops about 15,000 lb. of thrust. This is greater than the power of any British or U.S. engine yet in service and, with only two of them, the Soviet aircraft has a similar performance to the four-engined Comet, which is about the same size. It covered the 1,564 miles from Moscow to London in 3½ hrs., at an average speed of 446 m.p.h.

### Costly Target Practice

A Douglas Skywarrior twin-jet bomber belonging to the U.S. Navy was shot down recently over the Mojave Desert, California. It had developed undercarriage trouble during a test flight and, after circling for four hours without getting the wheels down, the crew of three took to their parachutes. To avoid the possibility of the two-million-dollar Skywarrior crashing anywhere where it could cause damage or injury, it was chased and destroyed by three U.S.A.F. jet fighters.

### Japanese Neptunes

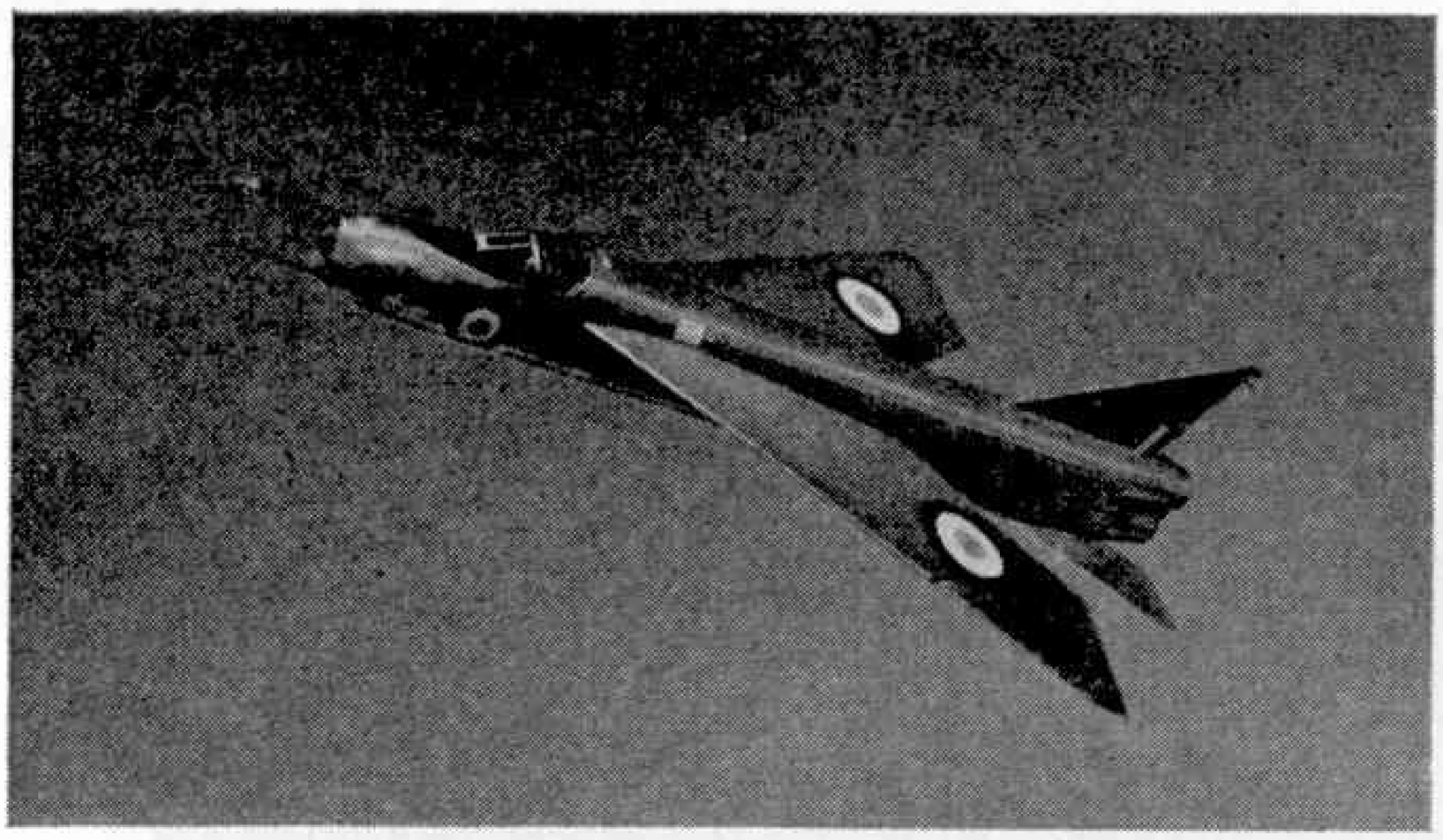
The striking force of Japan's Maritime Self Defence Force has been greatly increased by the supply of six Lockheed Neptune patrol-bombers under the U.S. Mutual Defence Aid Programme.

The Neptunes, which will be used for over-water reconnaissance and anti-submarine duties, are of the latest P2V-7 type, with under-wing jet engines to supplement the two regular 3,400 h.p. Turbo-Cyclones. They have magnetic detection gear in a long tail-sting, and a 70 million candle-power searchlight in the nose of their starboard wing-tip tank.

### Austria Restarts Commercial Flying

Austria is re-entering the civil aviation picture this summer, following the creation of a new company named Oesterreichische Fluglinien, or Austrian Airways. Like the German Deutsche Lufthansa company, it will rely heavily on outside help to get its operations under way, and its crews will be trained by Scandinavian Airlines System, who have put up 40 per cent. of the initial capital.

Austrian Airways hope to start operations this year between Vienna, Rome, Zurich, London, Frankfurt, Copenhagen and Oslo, flying Convair-440 Metropolitans and Douglas DC-6Bs. The network will be extended



**English Electric P.1 jet fighter on a test flight. Photograph by courtesy of The English Electric Company Ltd.**

to Belgrade, Paris, Stockholm, Warsaw and Moscow during next winter, and to Budapest, Athens and Teheran in 1957. All aircraft will be maintained at SAS bases in Scandinavia, and until Austrian crews have been fully trained their captains will almost certainly be SAS pilots.

### More Power for the P.1

It was announced recently that the first prototype of the English Electric P.1 fighter now has afterburners fitted to its two Armstrong Siddeley Sapphire turbojets and is flying faster than ever. It is said to handle very well, with no vices, despite its unusual design, and the two prototypes have been flown faster-than-sound in level flight on most of their 300 test flights.

More P.1s will be completed this year, and it seems certain that different power plants will be fitted in some of them or in the 20 pre-production aircraft. It is possible that one of the jets will be replaced by a rocket-motor, to improve performance at extreme heights; but a more likely mixed power plant formula would be to fit a removable rocket-pack under the fuselage.

### Silver Arrow to Paris

Latest venture by Silver City Airways is a combined road, air and rail express passenger service to Paris which offers fares little more than half those for a normal direct flight. Known as the Silver Arrow service, it is operated twice daily in each direction.

Passengers from London need report at Victoria Coach Station only 15 min. before departure, and are then carried in 40-seat coaches on the 3-hr. journey to Ferryfield Airport in Kent. There, after a short rest for refreshment, they board a Silver Arrow Bristol Wayfarer aircraft, which whisks them across the Channel to Le Touquet in 20 minutes.

At Etaples, the station for Le Touquet, passengers enter one of French National Railways' luxurious high-speed 50-60 seat autorail diesel cars, and arrive at the Gare du Nord in the centre of Paris 140 min. later.

### R.A.F. No. 267 Squadron in Malaya

One of the most unusual units of the Royal Air Force is No. 267 Squadron, which is based in Malaya and operates no fewer than five different types of aircraft. Its "Voice" flight uses Dakotas and Austers equipped with loudspeakers to broadcast messages from the air to terrorists in the jungle, usually to try and persuade them to surrender. A second flight is equipped with Pembroke and Harvard communications aircraft, and the third flight has Prestwick Pioneers.

Because of their short landing and take-off runs, the Pioneers are ideal for supplying jungle forts, where airstrips are often shorter than a rugby pitch and surrounded by 300 ft. trees and 6,000 ft. mountains. Typical is Fort Shean, which is accessible only by air, so that as well as flying in food and equipment the Pioneers are responsible for changing the garrison from time to time.

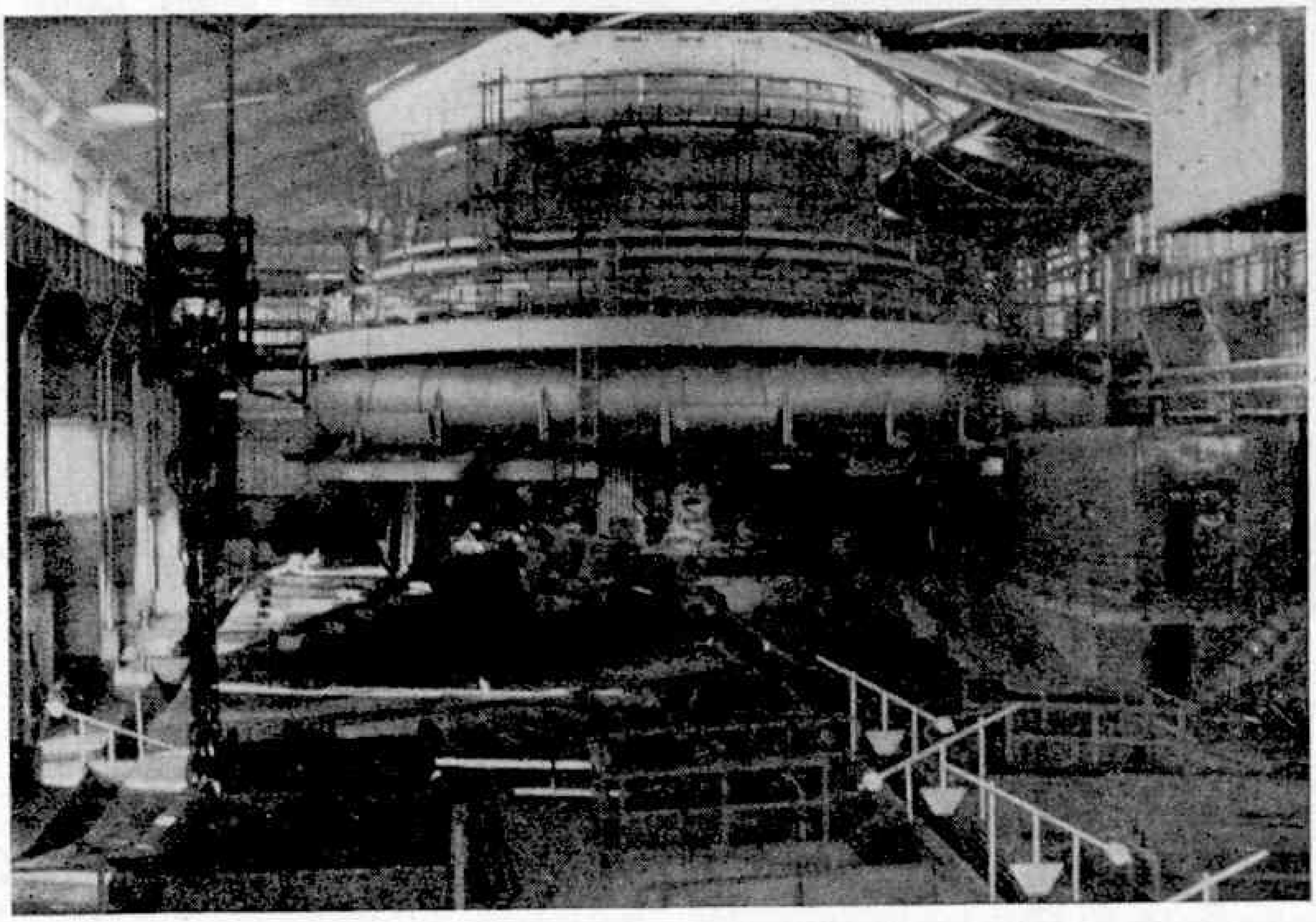
The forts are manned by British lieutenants, Malayan constables and local aborigine home guards, armed with shot guns or blow-pipes and poisoned darts. To help these people, the Pioneers also bring in school equipment for the children, and poultry and pigs to improve the quality of their small "farms". Sick aborigines have also been flown out for hospital treatment.

### New Viscount Cabin Layout

The first of B.E.A.'s Series 800 Viscount-Majors will be delivered this autumn, and the new aircraft are expected to be operating many of the Corporation's major international air services by the summer of 1957. When that happens, B.E.A.'s present fleet of Viscount 701s will be given a "new look" cabin layout, with 56 instead of the present 47 seats. This will enable them to make even more money, at little cost in roominess.



**The Prestwick Pioneer demonstrates its ultra-short landing on a strip cleared in the Malayan jungle.**



# Europe's Largest Blast Furnace

THE cover of this issue shows the new blast furnace at the Margam Works of the Steel Company of Wales Limited. The size of a blast furnace is a matter of the diameter of the hearth. That of the new Margam blast furnace is 29 ft. 9 in., and this makes it the largest furnace of the type in Europe. Its height is 242 ft., and 1,500 tons of steel and 415,000 bricks have gone into its construction. It is capable of making more than 10,000 tons of iron a week, and its stockyard can hold 150,000 tons of ore.

In the early days of the construction of the blast furnace, considerable trouble was encountered because of the presence of clay in the gravel bed below the ground, which made it difficult to obtain a satisfactory set for the concrete piles that support it. To overcome this liquid cement was pumped into the gravel and, when this had set, the piles, 445 of them, were driven to support the foundation block, which has a diameter of 75 ft.

New coke ovens, 90 in number, were built to provide the coke required by the furnace. The ore, coke and limestone with which it is charged enter at the top of the furnace, to which they are carried in skips travelling up a conveyor. The continuous blast of air for the furnace is supplied by a steam driven axial flow turbo blower of Swiss construction, which provides 125,000 cubic feet of air a minute and was the first of its kind to be ordered for use in this country.

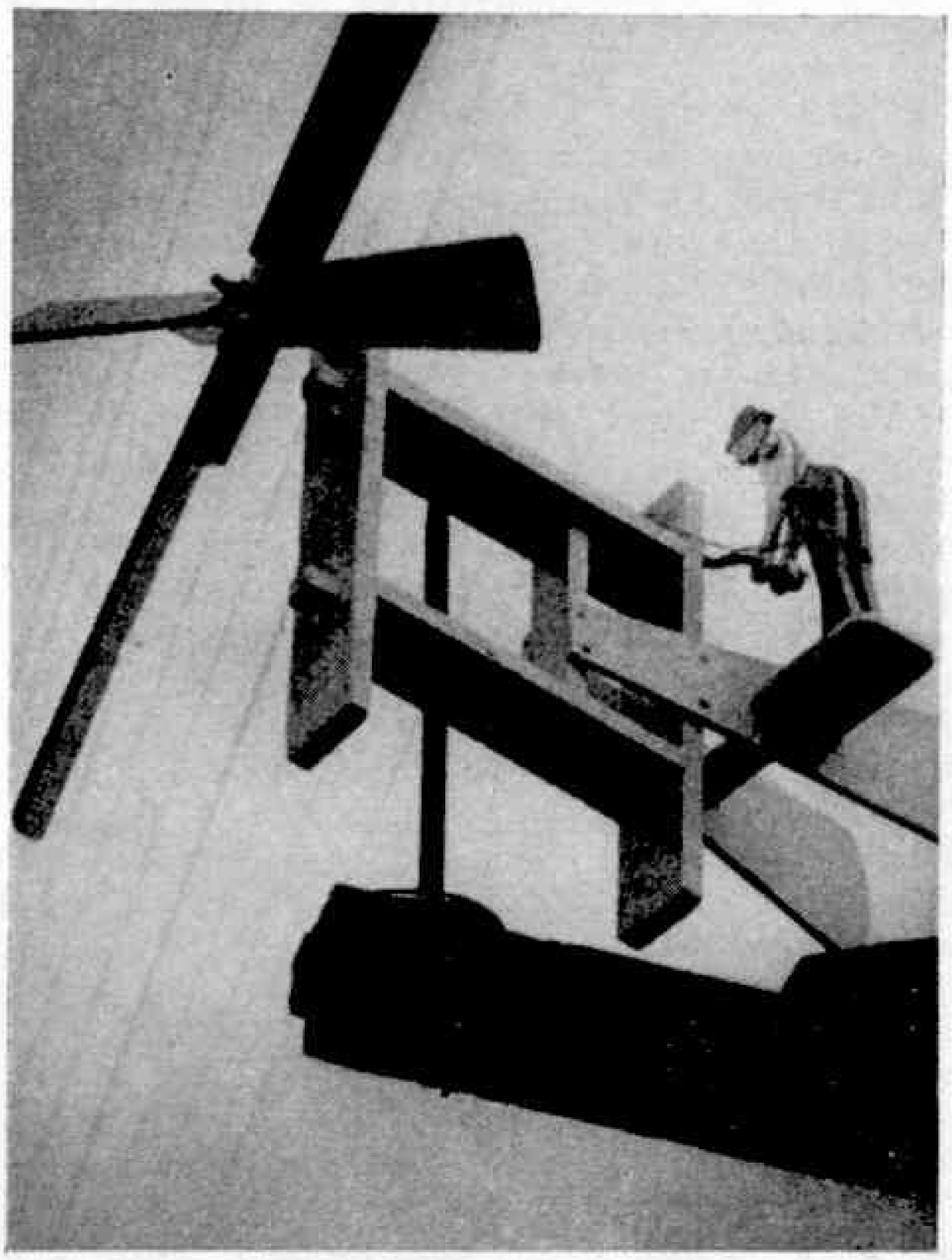
**Our cover this month shows the new No. 4 blast furnace brought into operation in January last at the Margam Works of the Steel Company of Wales Ltd., to whom we are indebted for the photograph on which it is based and for the picture of part of the cast house on this page. This picture shows the foot of the new furnace, and the channels that direct molten iron tapped from it into ladles that carry it to the open hearth furnaces for conversion into steel.**

In a blast furnace, in addition to iron, slag is produced. This is tapped from the furnace and run into pits alongside, from which it is loaded by mechanical digging equipment into heavy road vehicles that carry it to the tips. In this respect the new blast furnace differs from the others at the Margam Works, where the slag is run into ladles for conveyance to the tips.

The molten iron is tapped at intervals from the furnace, and runs into channels that direct it to the iron ladles in which it is carried to one of three melting shops for conversion into steel.

MECCANO MAGAZINE

# Junior Section



A very busy little man—when the wind is fresh—who can be seen over the entrance to a market garden at Groomsport, Co. Down. Photograph by James Gallagher, Belfast.

WHEN driving about the countryside near my home I often pass a house where on a balcony is a fine wooden model of a sailor, who can turn round completely and has arms that he can wave in the air without difficulty. He carries out these acrobatic feats only when there is a wind, and he always gives me the impression that he is controlling road traffic at a crossing. When something like a gale is blowing in from the sea his furious activity suggests that the traffic is made up entirely of fast racing cars.

I suppose it was the memory of my little sailor that made me welcome the picture on the right when it reached me. This shows a more elaborate working model. When the wind rotates the sails of the miniature windmill, the little man seems to be turning it, bending from the hips, and he too works very energetically when there is a strong breeze.

It seems to me that here is something of which to make a Meccano model. Why not try this? I will give a special prize for the best small model of this kind of which pictures or drawings reach me before the end of the month.

Youthful Hornby and Hornby-Dublo enthusiasts always interest me, and here is another. Simon Tuckey, seen in my second picture, seems to be operating his Hornby Railway quite well, although he is only three years of age. He is obviously wrapped up in it. This is not surprising, for it is his first, a birthday present, and he is well on the way to becoming a Hornby Train enthusiast.

THE EDITOR



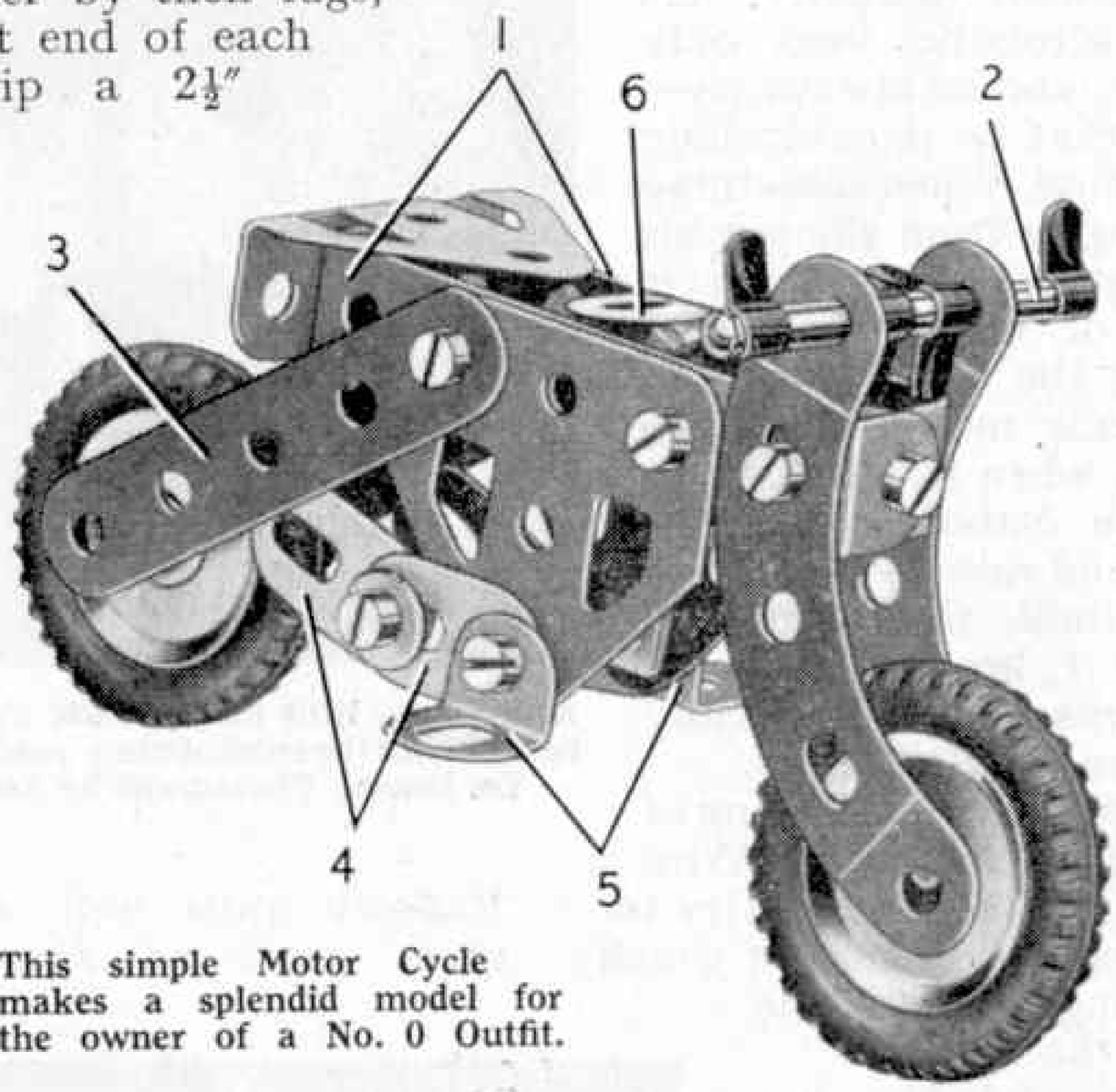
Simon Tuckey, of Tiddington, Stratford-upon-Avon, is only three years old, but is already a competent Hornby Train operator.

# Easy Model-Building

## Spanner's Special Section for Juniors

THIS month I have two attractive models suitable for owners of Outfits Nos. 0 and 1. The first is a realistic Motor Cycle, that can be made from the parts in Outfit No. 0, and the other is a Mechanical Horse and Trailer, for which an Outfit No. 1 will be required.

We will start with the Motor Cycle, which is shown on this page. You should begin the assembly by using two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 1 to make the upper part of the frame. Bolt the Double Angle Strips together by their lugs, and fix to the front end of each Double Angle Strip a $2\frac{1}{2}''$ Curved Strip. The two Curved Strips make the front fork of the model and a 2" Rod 2 should be passed through their upper ends and held in place by Spring Clips. The front wheel is a 1" Pulley fitted with a Motor Tyre, and its axle is a $\frac{3}{8}''$ Bolt. The Bolt should be passed through the lower hole in one of the Curved Strips, and the Pulley is fixed on it by tightening the set screw. The seat is a Trunnion and it should be attached by the same bolt used to connect together the rear ends of the Double Angle Strips 1.




**This simple Motor Cycle makes a splendid model for the owner of a No. 0 Outfit.**

The next step is to fasten a Flat Trunnion and a $2\frac{1}{2}''$ Strip 3 to each of the Double Angle Strips 1. Bolt together two Fishplates 4, and fix them, together with an Angle Bracket 5, to the pointed end of the Flat Trunnion. Two more Angle Brackets, one of which can be seen at 6, should be bolted to one of the Double Angle Strips 1 to represent the top of the petrol tank.

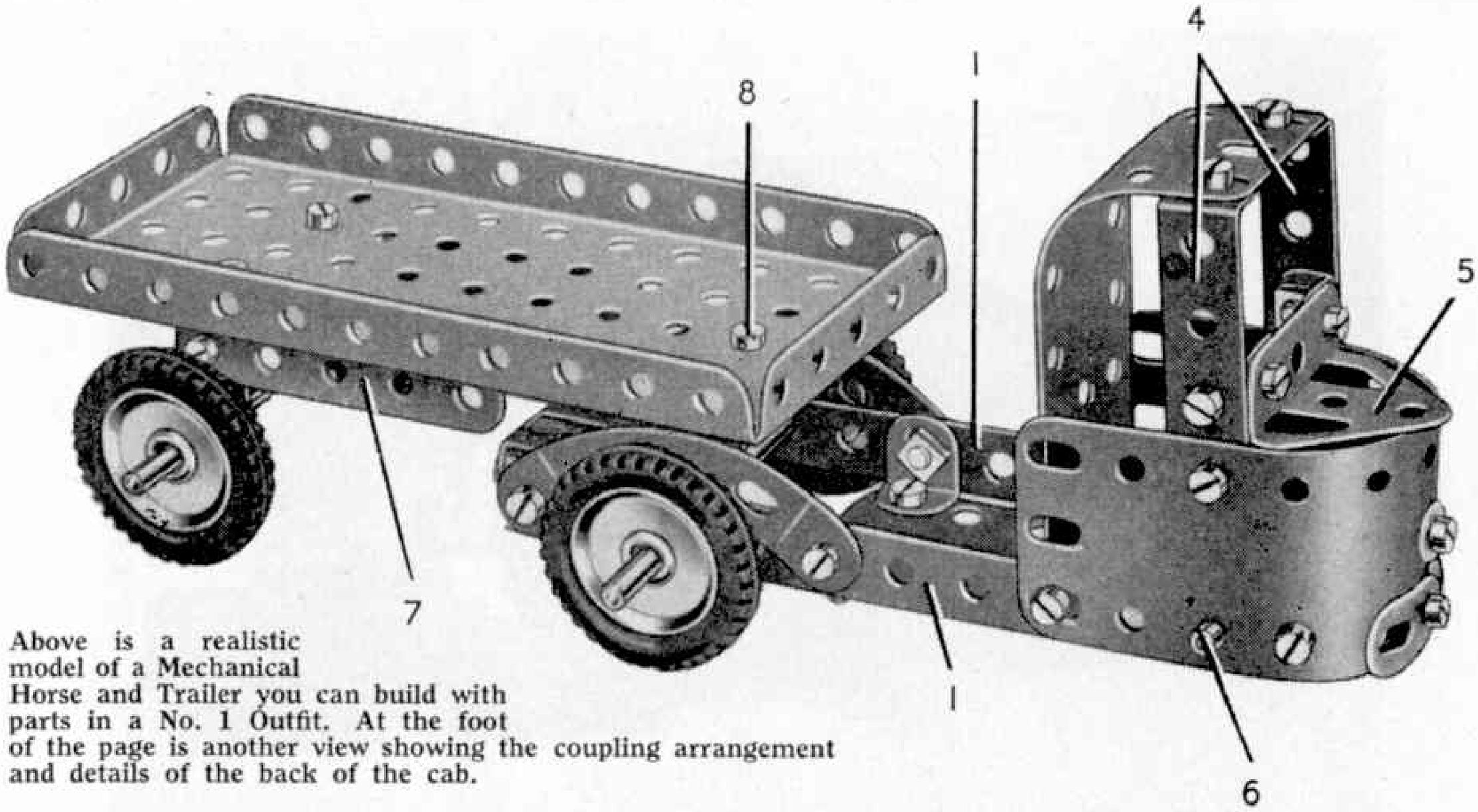
The rear wheel also is a 1" Pulley with Motor Tyre, and it should be mounted on a $\frac{3}{8}''$ Bolt passed through one of the Strips 3 in the same way as described in the case of the front wheel.

Parts required to build the Motor Cycle: 2 of No. 5; 4 of No. 10; 4 of No. 12; 1 of No. 17; 2 of No. 22; 4 of No. 35; 13 of No. 37a; 13 of No. 37b; 2 of No. 38; 2 of No. 48a; 2 of No. 90a; 2 of No. 111c; 1 of No. 126; 2 of No. 126a; 2 of No. 142c.

We come now to the Mechanical Horse and Trailer shown in the two illustrations opposite. Construction of this model should be begun by bolting Angle Brackets and $2\frac{1}{2}''$ Stepped Curved Strips to two $5\frac{1}{2}''$ Strips 1. Then bolt a Trunnion 2 to the Angle Brackets, and fix a $\frac{1}{2}''$ Reversed Angle Bracket 3 to the Trunnion. Now bend the front ends of the Strips 1 slightly inward, and to them fix a $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate curved into U-shape. This Flexible Plate forms the bonnet and the sides of the cab of the Mechanical Horse, and two Fishplates should be bolted to it to represent the bumper at the front of the model.

You can make the windscreen by bolting a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 4 to each side. Next attach Angle Brackets to the Double Angle Strips and to these fix a Trunnion 5. For the back and the roof of the cab you should use a $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate shaped as shown in the lower picture. Bolt the upper end of this Plate to the lugs of the Double Angle Strips 4, and attach the lower end to Angle Brackets fixed to the Strips 1.

For the front wheel you should mount a Bush Wheel on a 2" Rod 6. Pass this Rod through the sides of the bonnet and use Spring Clips to hold it in place. The




**Above is a realistic model of a Mechanical Horse and Trailer you can build with parts in a No. 1 Outfit. At the foot of the page is another view showing the coupling arrangement and details of the back of the cab.**

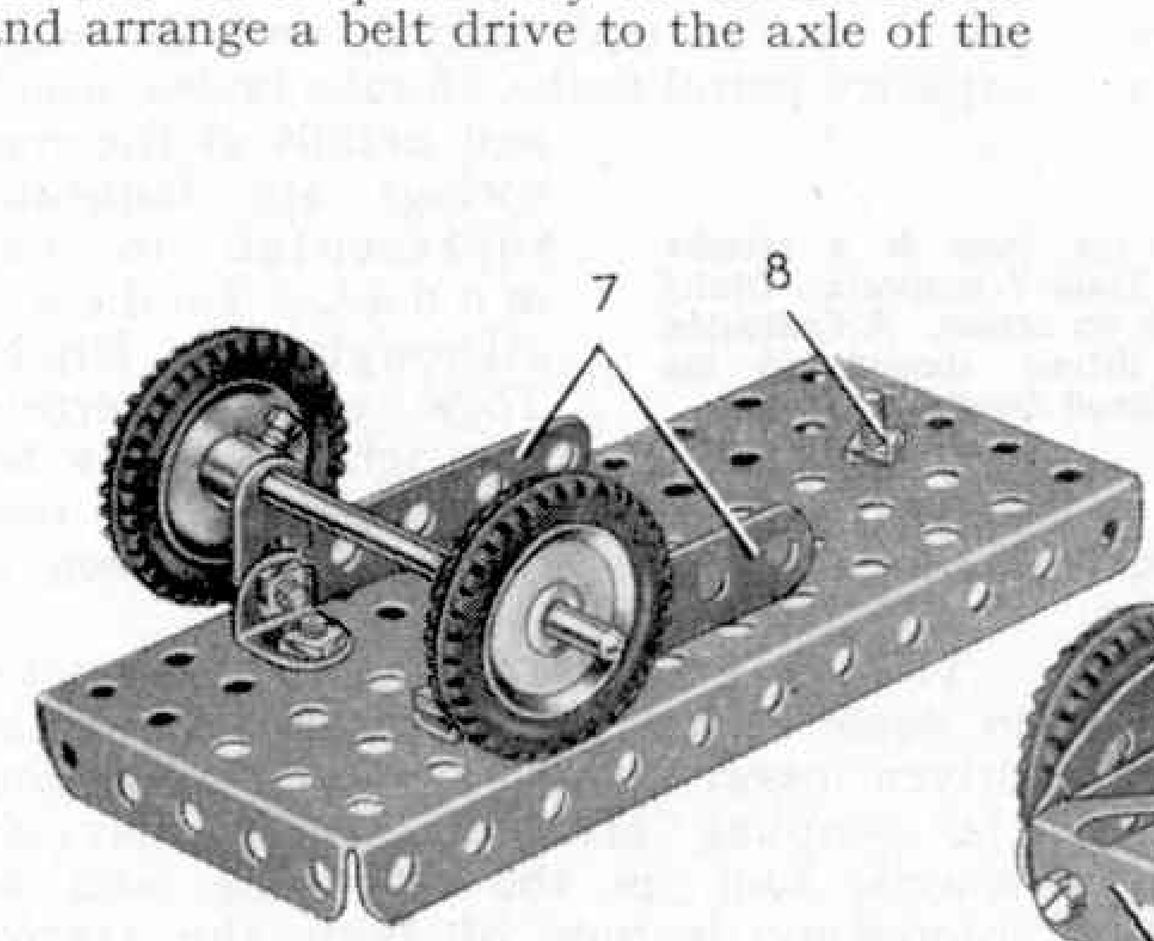
rear wheels are 1″ Pulleys with Motor Tyres and they should be fixed on a 3½″ Rod supported in the Strips 1.

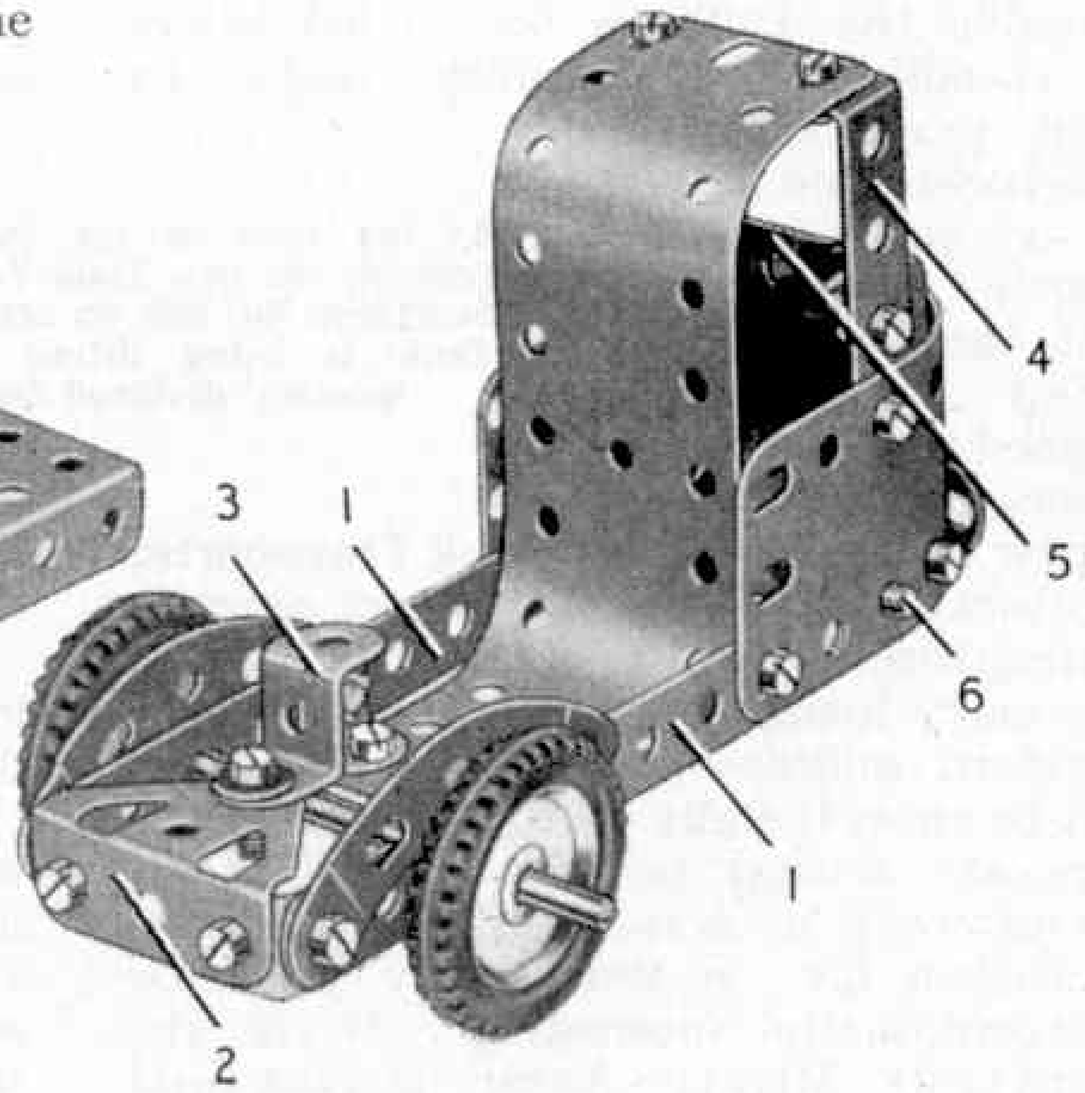
The Trailer is a 5½″ × 2½″ Flanged Plate fitted with two Angle Brackets as shown. Bolt a Fishplate and a 2½″ Strip 7 to each Angle Bracket, then pass a 3½″ Rod through the Fishplates. The wheels are 1″ Pulleys with Motor Tyres and they are fixed on the 3½″ Rod.

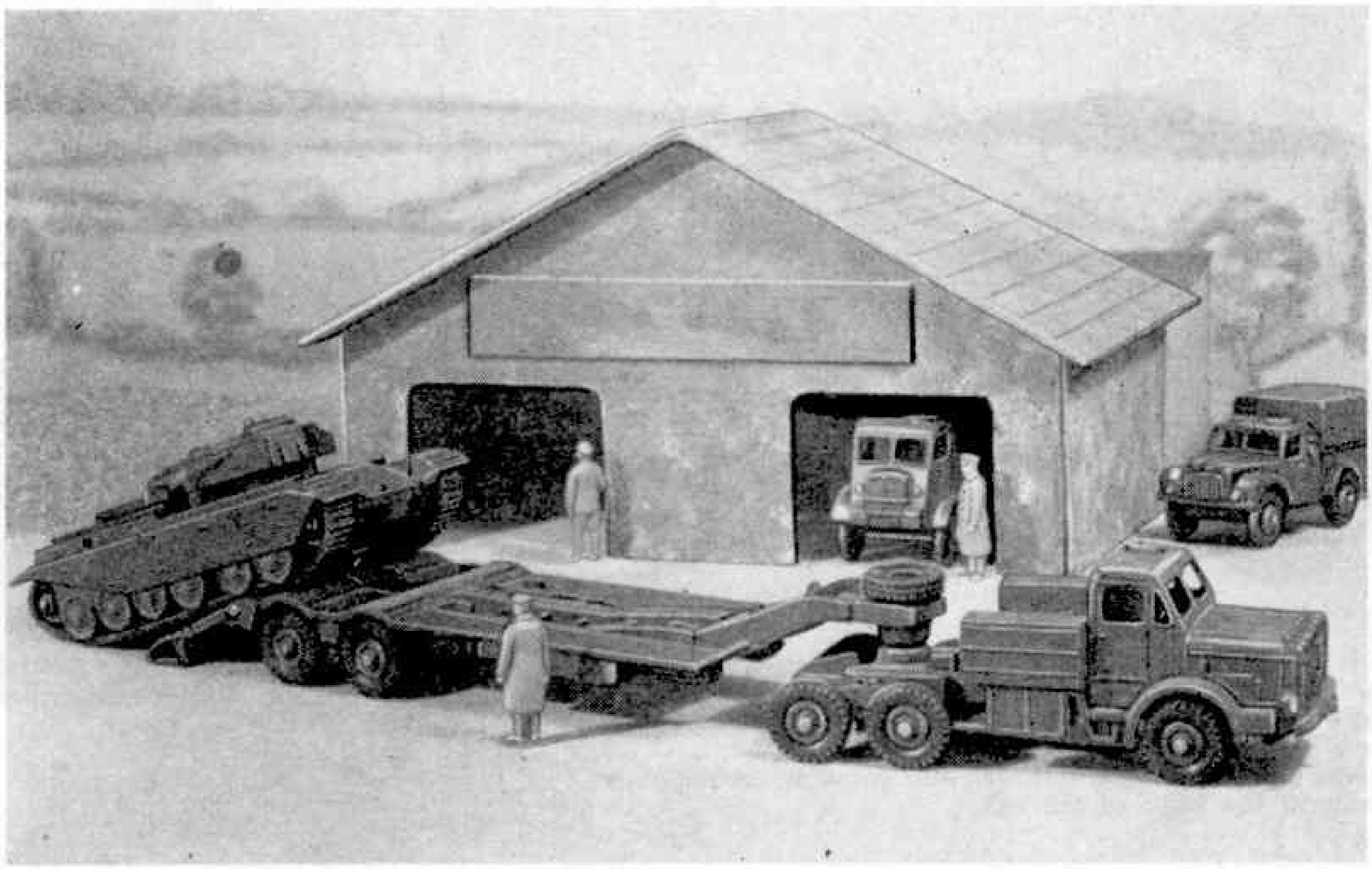
To couple the Trailer to the Mechanical Horse you should fix a ⅜″ Bolt 8 in the Flanged Plate. This Bolt can be inserted in a hole in the ½″ Reversed Angle Bracket 3.

If you have a *Magic* Clockwork Motor for driving your models you can make good use of it in the Mechanical Horse and Trailer. It is quite easy to fit the Motor and arrange a belt drive to the axle of the Trailer. The Motor should be bolted underneath the Flanged Plate of the Trailer between the 2½″ Strips 7. Take care that the Motor does not catch the Trunnion 2 when the Trailer is coupled to the Mechanical Horse. When the Motor is in position all you have to do is to connect it by a Driving Band to a Pulley on the Trailer axle.

Parts required to build the Mechanical Horse and Trailer: 2 of No. 2; 2 of No. 5; 4 of No. 10; 8 of No. 12; 2 of No. 16; 1 of No. 17; 4 of No. 22; 1 of No. 24; 4 of No. 35; 28 of No. 37a; 24 of No. 37b; 6 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 4 of No. 111c; 1 of No. 125; 2 of No. 126; 4 of No. 142c; 2 of No. 189.





# DINKY NEWS

By **THE TOYMAN**

## A Transporter for the Centurion

IT is quite a long time since a new Army model was added to the range, but the Tank Transporter, Dinky Supertoys No. 660, introduced this month should more than satisfy those collectors who have asked for another Army vehicle.

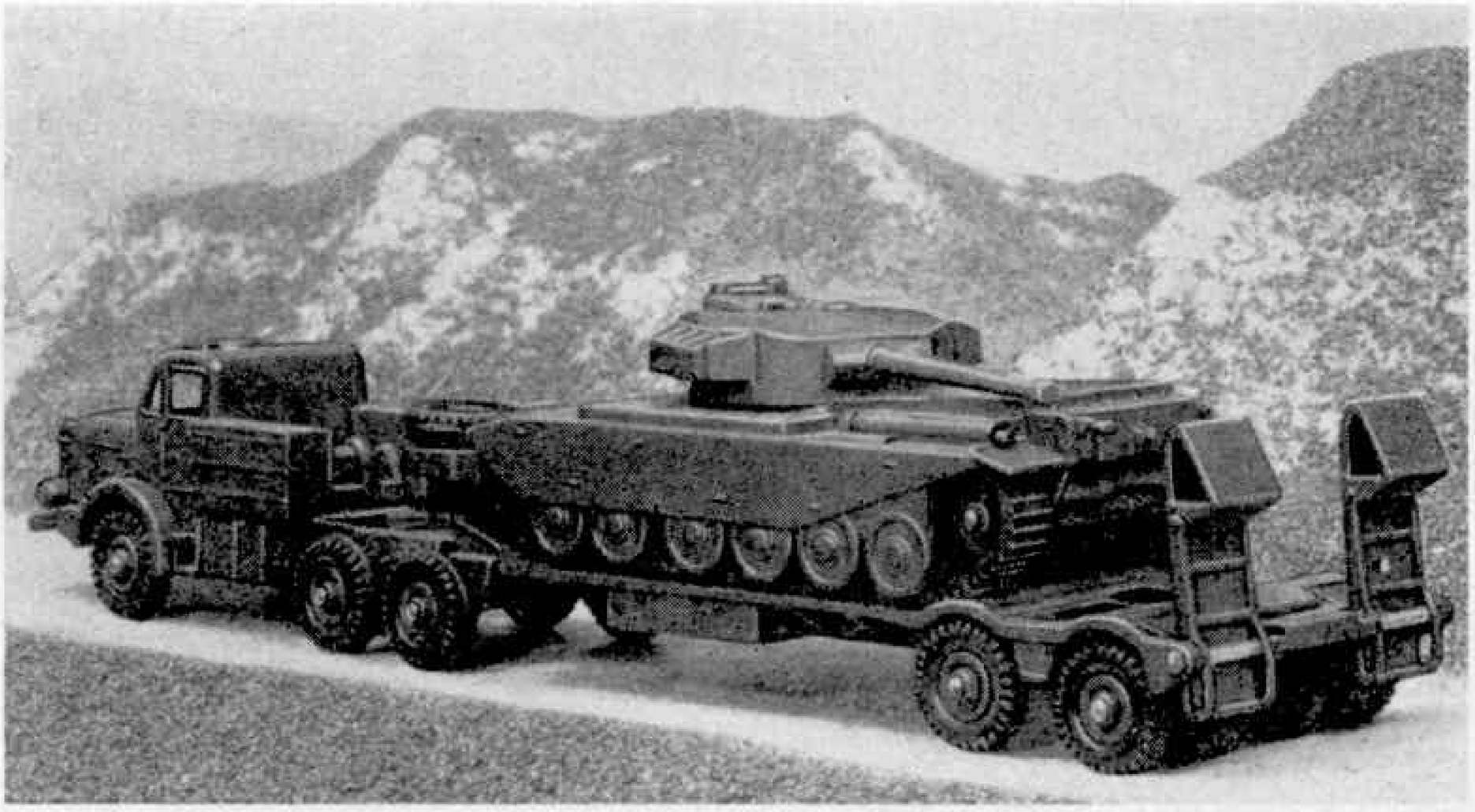
The Centurion Tank is an established favourite with Dinky Toys and Supertoys collectors, but to make the best use of this fine model a special vehicle is required to enable the Tank to be carried safely and speedily along ordinary roads. In actual practice, when tanks have to be moved for a considerable distance along main roads they are usually loaded on specially designed transporters or carriers, and now with the new Dinky Supertoys Tank Transporter collectors can carry out the correct practice in miniature.

**At the head of the page is a picture showing the new Tank Transporter, Dinky Supertoys No. 660, in action. A Centurion Tank is being driven aboard up the specially designed loading ramps.**

To carry loads of the size and weight of a modern military tank the transporters must be exceptionally sturdy and powerful. There are several vehicles used for this type of work in actual practice, but the one chosen for our new Dinky Supertoy is exceptionally interesting. It is the Thornycroft Mighty Antar tractor and is fitted with a semi-trailer specially designed to enable tanks to be loaded and carried easily and quickly.

The Mighty Antar is powerful and sturdy in construction. It has twin driven rear axles mounted in a special bogie unit, and will haul exceptionally heavy loads along roads or over rough country. The new Dinky Supertoy captures in full measure the impression of power and strength given by the real tractor, and the large capacity petrol tanks, storage boxes, winch and details of the rear springs are faithfully represented in the model. Indeed, although all Dinky Toys and Supertoys are rightly famous for their detail, this new model is one of the best I have seen in this respect.

The semi-trailer is pivoted to the tractor in such a way that the model can be driven over obstacles without straining the coupling arrangement. It has six wheels, four on the rear axle, and an interesting feature of both the tractor and the semi-trailer is that one axle in each case is mounted in slotted bearings, so that all the wheels remain on the



**The Tank Transporter is seen here carrying a Centurion Tank along a road through rough country. Note the travelling positions of the loading ramps.**

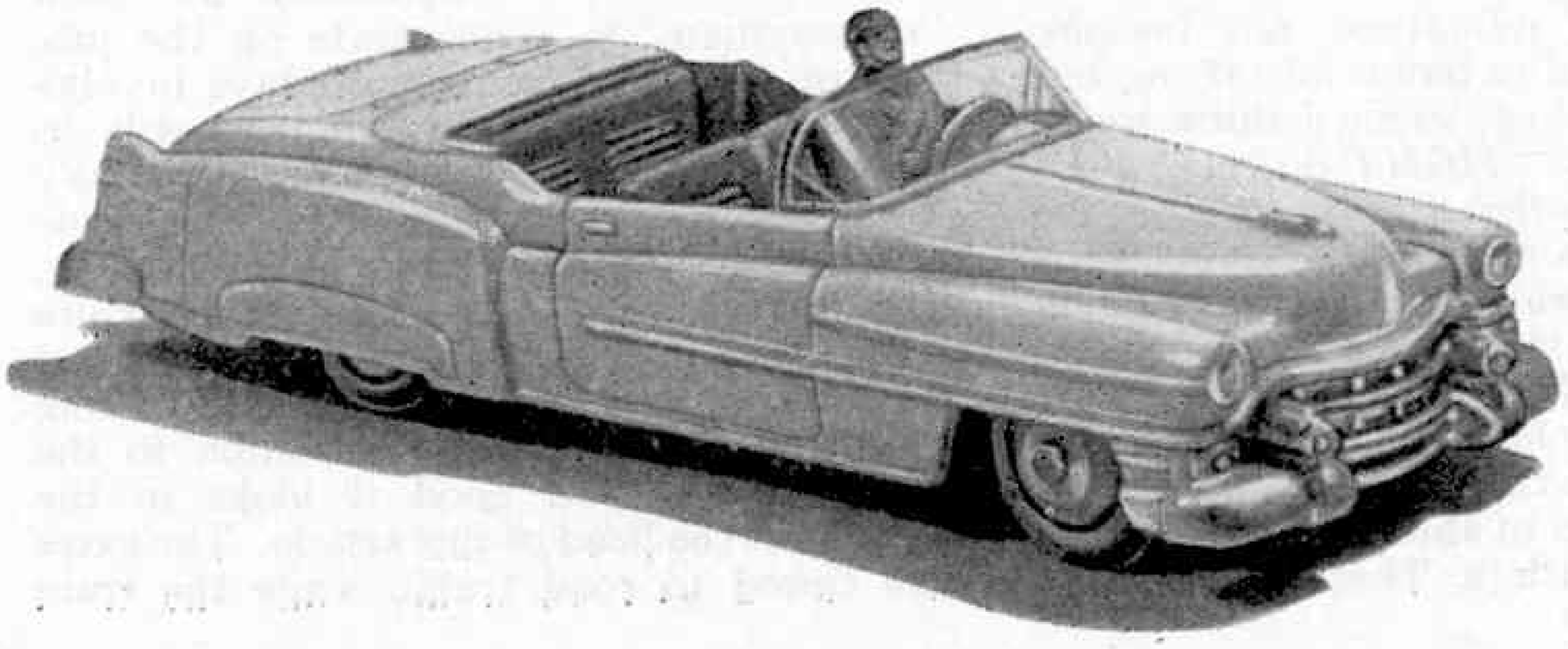
ground even if the surface over which it is driven is not level.

The semi-trailer is exceptionally well made, with hinged ramps at the rear to allow a tank to be driven or hauled into place. These ramps have slotted holes through which the pivot pin is passed. When the model is ready for the road, and the ramps are raised, they drop to the limit of the slots and are automatically held in place.

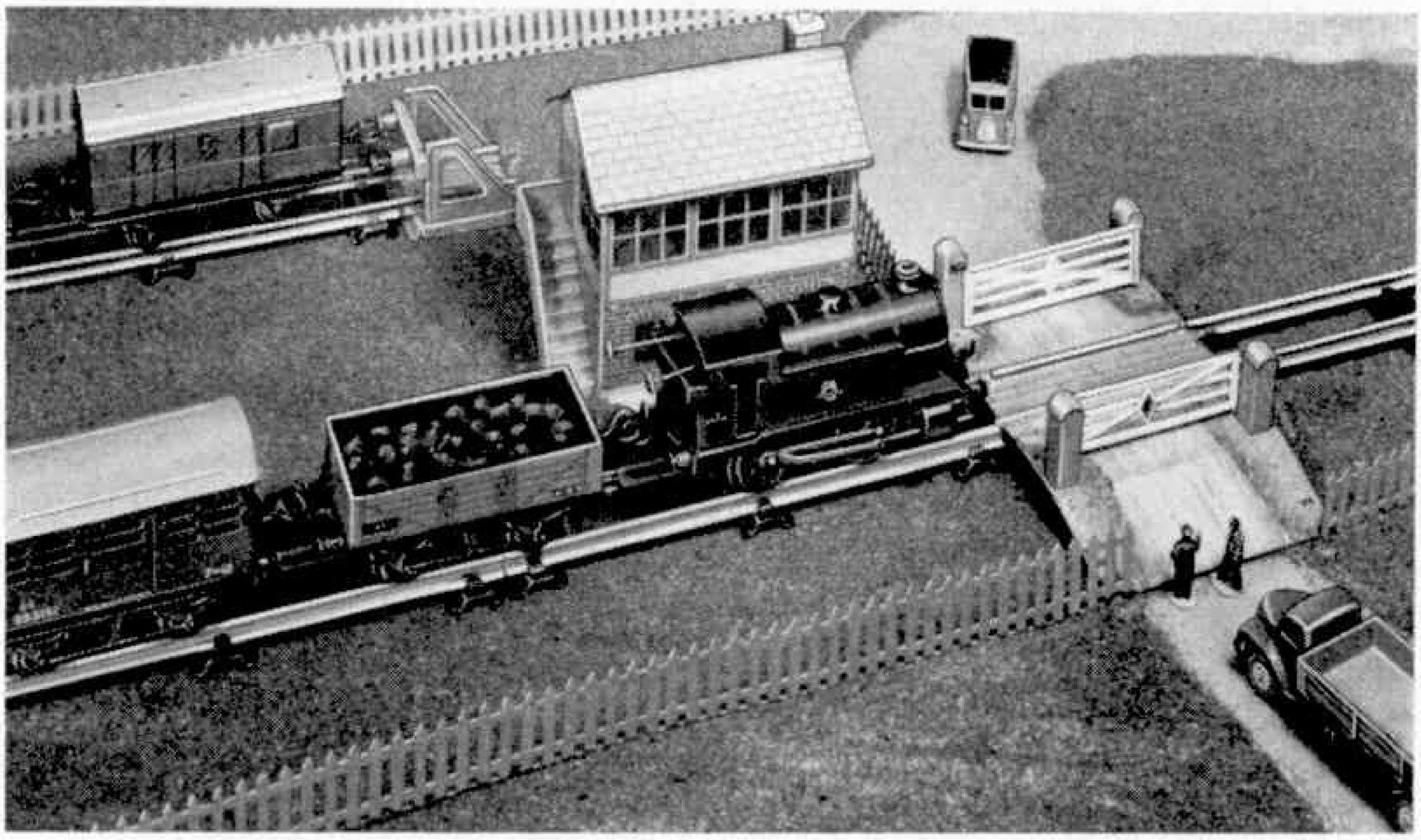
In one of my pictures the Tank Transporter is shown at an Army depot, with a Centurion Tank being driven up the ramps into position on the semi-trailer. The second picture shows the model with the Tank in position and the ramps raised. By the way, when the Tank is on the semi-trailer it is located by special guide rails and blocks, so the Tank Transporter can be operated over rough country without any danger of the Tank sliding out of place.

The new model is correctly finished in green with Royal Armoured Corps signs at the front of the tractor and on one of the ramps at the rear of the semi-trailer. As usual a miniature driver is fitted.

The second new model this month is vastly different from the Tank Transporter in appearance and purpose, but it is sure of a no less enthusiastic reception. Judging from my correspondence, there is an unlimited demand for models of the large and stylish American cars, and now a further addition is being made to the range. The Dinky Toys Cadillac Eldorado Tourer, No. 131, is a really attractive miniature of this distinctive car. It is beautifully proportioned, with plenty of detail, and is fitted with a miniature driver and a transparent windscreen. The Cadillac Eldorado is available in two attractive colour schemes, salmon pink with grey seats and yellow with red seats. In both schemes the wheels are stone coloured, and the bumpers and radiator grilles are finished in aluminium.



**This splendid model is the latest addition to the range of Dinky Toys private cars. It is the Cadillac Eldorado Tourer, Dinky Toys No. 131.**



# Round About The Railway

By "Tommy Dodd"

SCARCELY a day goes by without the arrival of letters from some of you giving me the latest news of your Hornby Railways. I am always glad to hear how your layouts are progressing, and the interesting things you tell me often suggest subjects for our talks in these pages.

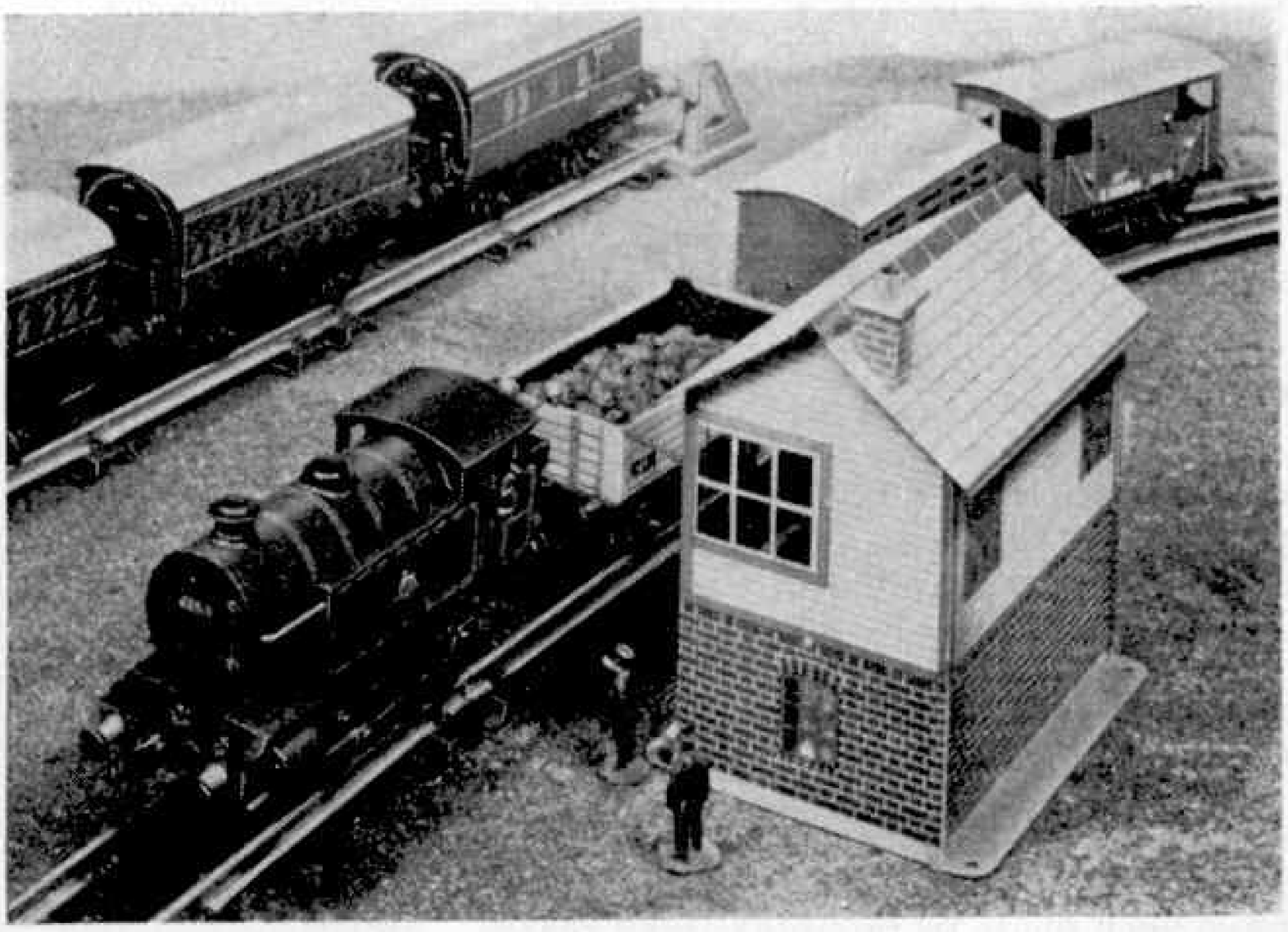
In building up a railway, additions to the track play a necessary part, for as the main line grows so also does the need for sidings, loops and so on. Sidings involve Buffer Stops, so I am never surprised to hear from a reader that he has recently added one or more of these necessary items to his equipment. There is a special fascination about buffer stops, either real or in miniature, not because trains are intended to bump into them, but because of the feeling, which I think we all get, that they just *MIGHT* do so!

The Hornby Buffer Stop is an effective representation of a real one and it forms the only satisfactory way of finishing off a plain siding, or the platform track at a station where the railway ends. It can be firmly connected to the last piece of track, not only by means of the usual rail head pins, but also by means of the Connecting Plate that is supplied with it. This should always be used, especially on a temporary railway, where the track is not screwed down; otherwise, if you *do* have a runaway train it may push the Buffer Stop off the end of the track if it runs into it.

Buffer stops *are* sometimes demolished in this way on real railways, but we don't want that to happen on our Hornby Railways. It is specially important to watch out for this sort of thing when two or more enthusiasts are playing trains together. "Instructions" from one of you to another, and the moving about usually necessary when a fairly large layout with several Points has to be managed, make it very necessary for each "railwayman" to concentrate on the job.

**Above is an effective scene at a Hornby Level Crossing, where the gates are attended to by the "signalman" in the Signal Cabin alongside. Road traffic is held while the train goes by with a No. 40 Tank at its head.**

Most Hornby layouts nowadays involve road effects to a certain extent, if only to give opportunity for introducing Dinky Toys, which is a very good idea. But roads also justify the inclusion of a Level Crossing, and indeed call for it. The smart white painted gates, with the red diamond-shaped warning boards, make a Level Crossing specially attractive as an addition to the railway. See how good it looks in the picture at the head of this article. The gates are closed to road traffic while the train



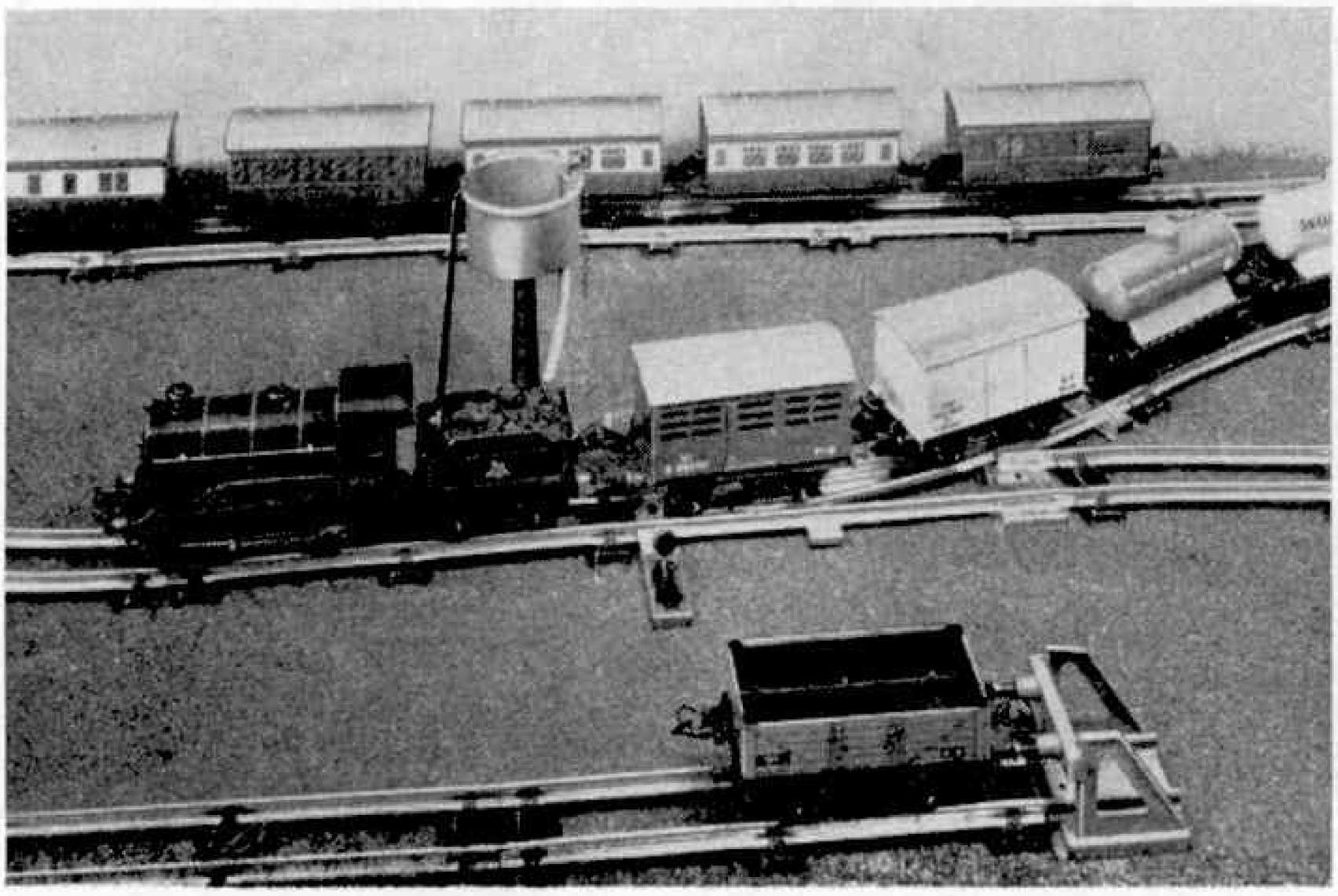
**Passing the "Yard Box," the driver of a No. 40 Tank receives orders from a "yard inspector" on the ground.**

passes. They may have to remain closed for a little while if the railway is a continuous one and the train is likely to make several circuits, Then, for a spell—while the engine is being wound up again, perhaps—the gates can be opened for road traffic and so closed to the railway.

The situation shown is a typical one, just like those you can see at different places all over the country. The working of the gates is the duty of the man in the signal cabin. Sometimes at an important crossing the gates are worked by means of a large wheel in the signal box, but at others the signalman has to pop down the steps and push the gates himself. On a Hornby railway, here is a duty in which the younger members of the staff will revel. In order to avoid any mishaps the train operator should let the "Crossing keeper" know what his running plans are. Then the gates can be managed accordingly and the movements of road traffic can be fitted in to suit.

Apart from situations along the main track, such as at crossings, stations or junctions, the Signal Cabin of the Hornby system is a necessary item in any fairly large yard or system of sidings. Control of the trains in and out, and shunting movements inside the yard, come under the supervision of a signalman in such a situation. Here is a good chance to make use of some of the railwaymen figures that most of you probably possess. A few of them can always be dotted about the yard, like those shown in the illustration above. Another good spot for a figure, and an effective one too, is on the little landing at the top of the steps leading into the Signal Cabin.

Don't forget that real engines need water, and plenty of it. Now Hornby engines don't, but even if they are only Clockwork ones they should halt from time to time at the Water Tank. The Tank may be situated at the platform end of your Station, or in the siding, where your engines normally live when they are not running trains.



**The Water Tank and the Buffer Stop are necessary features in the yard of this Hornby Railway.**

# Of General Interest

THIS month again we have both old and new on this page. The old is represented by the bollard shown in the picture on the right. This is on the bank of a Lancashire stretch of the Leeds and Liverpool Canal, and its curious appearance is due to the friction of ropes wound round it through many years of mooring barges alongside.

Now for the new. For a long time blocks for illustrations in books and magazines, including those for the *M.M.*, have been made by etching copper plates, but now an entirely new optical and mechanical process has been introduced for making printing blocks of plastic material. One of the machines employed for this, known as Scan-a-Gravers, is shown in the lower picture on this page.

In this machine two cylinders are used, one to carry the original photograph and the other a sheet of plastic material that is to form the actual block. They have a common shaft, so that they rotate together when the machine is in use.

Over the cylinder carrying the photograph

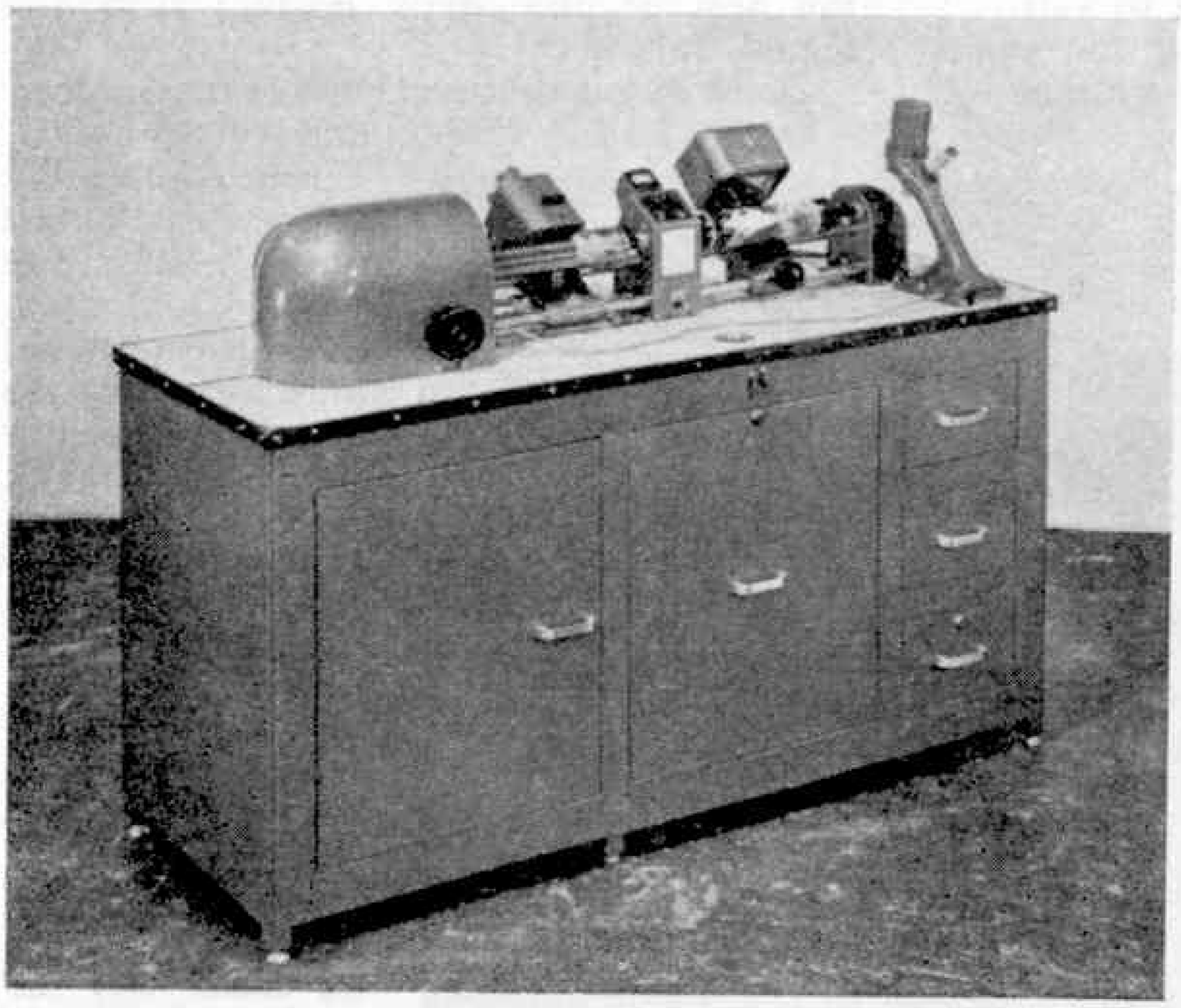


**A bollard that carries the marks of years of use. Photograph by W. S. Garth, Tyldesley.**

is a scanning head, which holds a light projector and a photo-electric cell. A pin point of light from this is projected on the photograph as it rotates and is reflected back to the scanner, the intensity of the reflected beam at any moment depending on the density of the small section of picture being scanned. The impulses of this light are amplified and transmitted to an engraving head mounted over the cylinder carrying the plastic block material. They cause a heated stylus to penetrate the plastic material many times a second, where it burns out small portions to varying depths. The unburned portions of the plate form the printing surface.

It only requires a few minutes to set up the machine for producing a block, and it then continues to operate almost automatically.

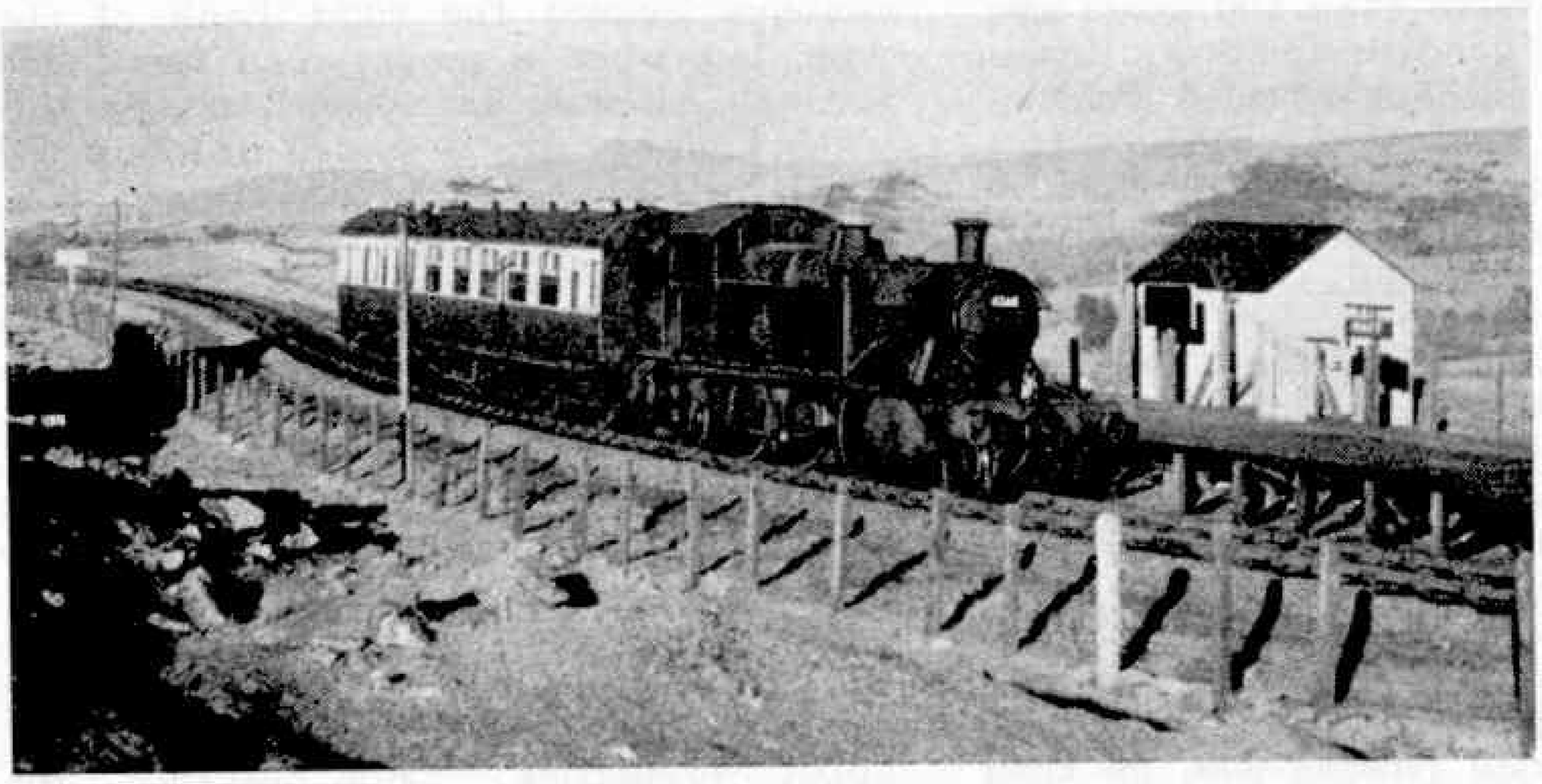
There is a picture printed from a block made on one of these machines on page 668 of the *M.M.* for December last. Compare it with other *M.M.* pictures.



**The Scan-a-Graver, a semi-automatic electronic engraving machine for making printing blocks. Photograph by courtesy of J. F. Crosfield Ltd.**

# From Our Readers

*This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.*



**A train at Ingra Tor Halt, on the Yelverton-Princetown Railway, closed in March of this year. Photograph by C. E. Wrayford, Bovey Tracey.**

## The Princetown Railway

Never again will it be possible to make the fascinating railway journey up to the heights of Dartmoor over the unique Yelverton-Princetown railway, closed on 5th March last.

Although Yelverton and Princetown are only six miles apart, the tremendous climb necessitates such a tortuous route that the line covers 10½ miles, mostly at 1 in 40. The first station is Dousland; then comes Burrator Platform, from which a magnificent view can be obtained of Burrator Reservoir, the source of Plymouth's water supply, and the Meavy valley. The line then climbs northward up to the open moor and Ingra Tor Halt is reached. This is seen in the accompanying photograph.

Shortly after comes the climb around King Tor to King Tor Platform, high up on the hill. There the line is only about 440 yds. from where it was about 2 miles back along the line, but it is at a much higher level, and soon passes North Hessary Tor, with its giant television mast, and so into Princetown, 1,373 feet above sea level and the highest railway station in England.

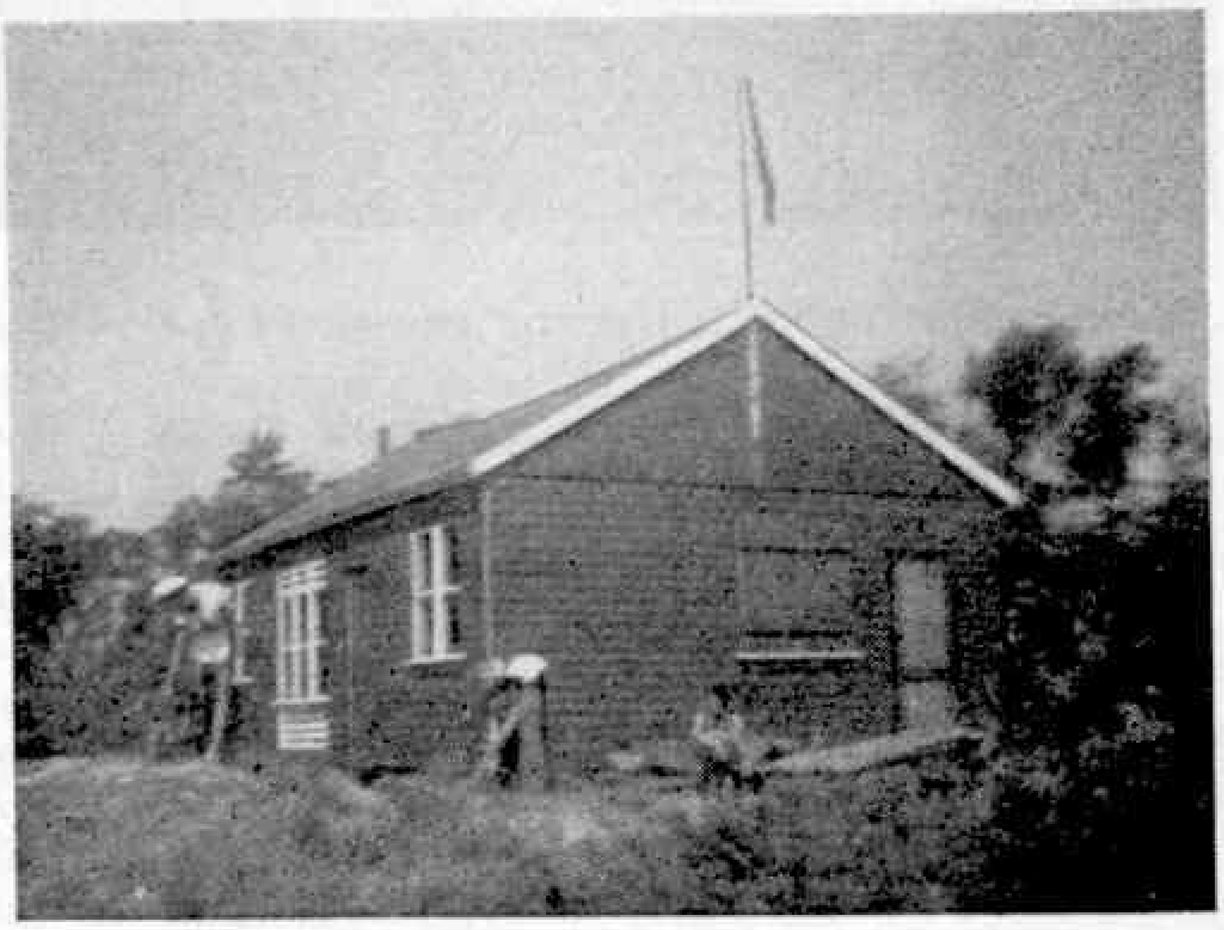
C. E. Wrayford (Bovey Tracey).

## Our Summer Cottage

In the heat of the summer, Canadian highways are crowded with cars heading north. These cars belong to city dwellers going to their cottages to escape the summer heat. Our car is usually one of these. We are heading for Parry Sound, 200 miles north of Toronto.

Our cottage cannot be approached by land, so at a dock we unload the contents of our car into our boat. As the outboard motor pushes us slowly across the lake we notice the breathtaking scenery, with wind-swept pine trees amazingly grasping their living from the meagre soil among the great rugged rocks. We round a point and enter the bay on which our cottage is located, and we are at last at our summer home.

Diane Gibbon (Toronto, Canada).



**The summer home of Diane Gibbon, a Canadian reader of the "M.M."**

# Transport Without Wheels

By Arthur Nettleton

ASTONISHING though it may seem, until little more than 100 years ago, much carrying of goods up and down Britain was performed without wheeled vehicles. From the 14th to the early 19th century the chief means of transporting merchandise was the pack pony, which could follow narrow tracks and did not need wide highways.

This mode of transport was not superseded until the development of coaching made better roads necessary, and even today there are many souvenirs of pack pony days to be found up and down our countryside.

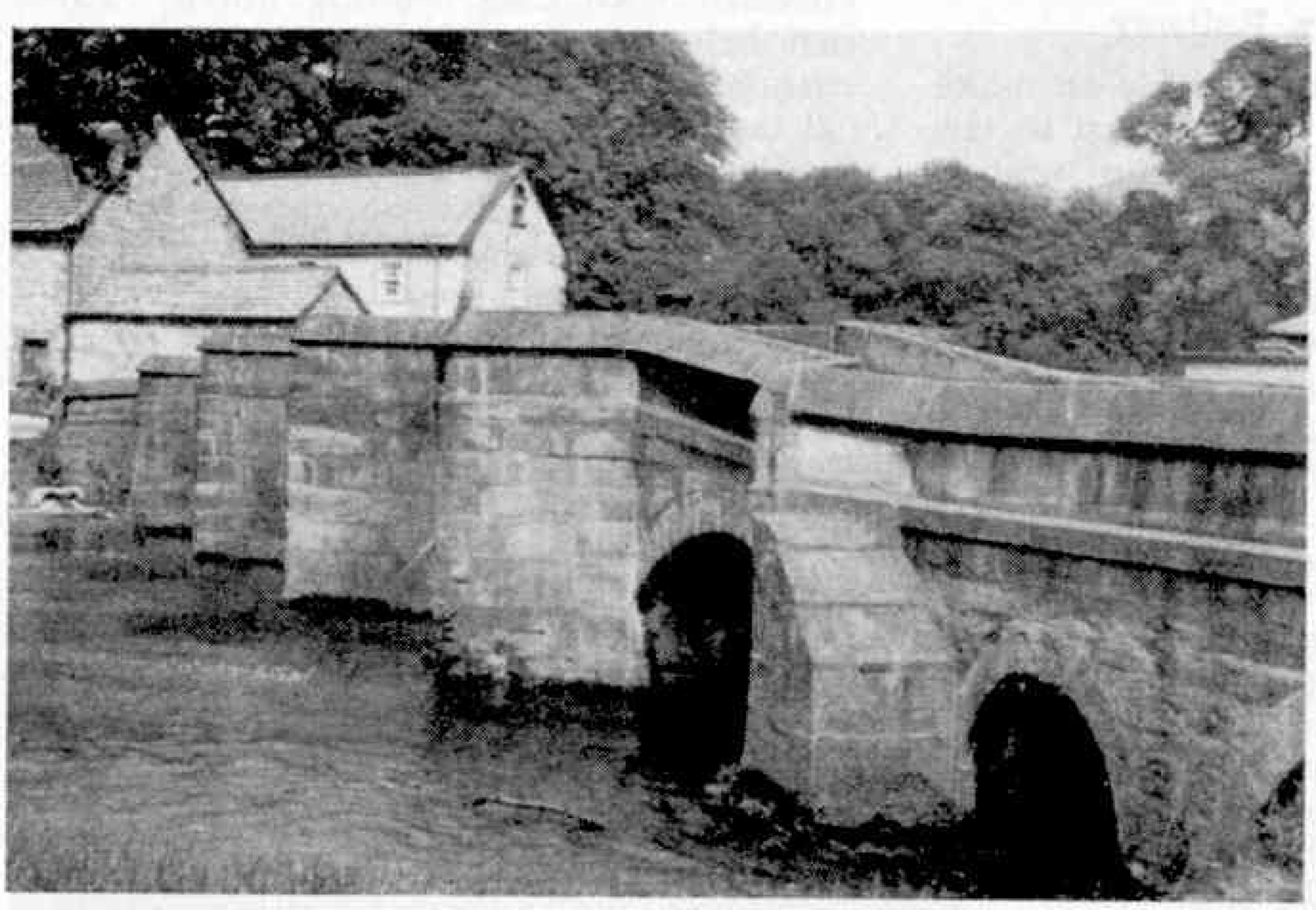
In particular, there you will come across bijou bridges, too narrow for modern traffic but perfectly suitable for ponies with packs carried pannier-wise on their backs. In a few areas there are narrow paved ways made in bygone centuries for such transport.

A fine humpbacked bridge from those days spans a tributary of the River Aire at Beckfoot, near Bingley, in the Aire Valley. It was built about 200 years ago to replace a wooden bridge. The cost was £30, and for that sum the builders were required to keep it in repair for 21 years—an early instance of service after sale!

Like many other similar structures, this one has survived largely because it stands on a now little-used route. The pony convoys hugged the right bank of the Aire, but when a proper road was made through Airedale for wheeled traffic, this wider highway was re-routed to follow the other bank.

The old track is still just a bridleway, but it was part of the regular route from the West Riding to the North West of England and Scotland in the era of pony transport. Near the bridge at Beckfoot stands a farmstead ornamented with the lantern sign of the Knights of St. John of Jerusalem, ample proof of the popularity of the route in olden days.

Pack pony transport was used to collect and distribute wool, corn, and other commodities from the widely-scattered abbey properties. For instance, the lands held by the monks of Fountains Abbey, near Ripon, covered more than a million acres and extended well into the Pennines as far west as Settle. Ancient green tracks in that region are still sometimes referred to as monks' roads, along which the strings of ponies were driven. Some of the attractive bridges that carry modern traffic in the Yorkshire Dales were built originally for pack ponies, but have since been widened for wheeled vehicles.



**This lovely packhorse bridge spans the Wye just outside Bakewell, in Derbyshire. Its official name is Holme Bridge.**

Buckden Bridge, in a pleasant setting beneath the fells of Higher Wharfedale, began as a narrow structure when large quantities of wool were collected in the district from sheep grazed there by the monks of Fountains.

An interesting, unspoiled packhorse bridge can be seen in the Washburn Valley, between Otley, in Wharfedale, and




**The Old Sun Inn, Kirkby Lonsdale, Westmorland, dating from the time when pack ponies passed through the town on their way to and from Scotland.**

•

Pateley Bridge, Nidderdale. It has only one arch, and although the present structure is only just over 200 years old, there have been earlier ones on the site.

Like other bridges built for pony transport, this one has low, wide parapets. They were designed that way to enable the ponies to cross without being unloaded, the packs overhanging the sides of the bridge. Fording the streams was disliked by the drovers, for the animals sometimes lay down in the water and ruined the goods they were carrying!

The beasts of burden were often German-bred Jaeger ponies, small but strong creatures able to carry two one-hundredweight packs for long distances. Between 20 and 40 such animals made up a train, with two or three drovers and an armed escort to protect the goods.

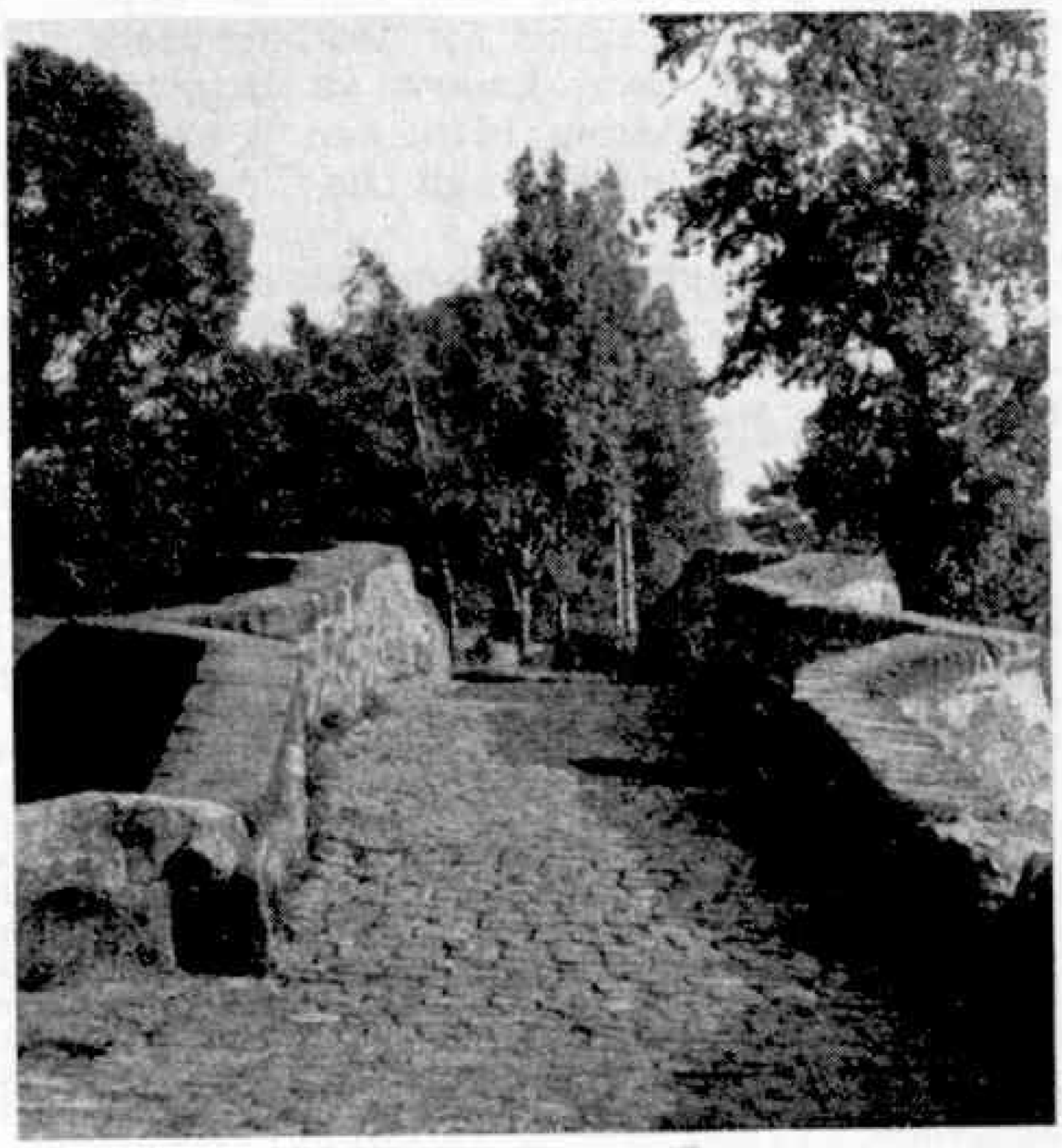
Clashes sometimes broke out between different pony trains, especially when two of them met on a narrow track and neither wanted to give way. Among the goods carried, in addition to wool and corn, were cloth, flax, coal, iron, lead and salt. Salt was one of the most important commodities, being needed for salting meat each autumn to preserve it. The Cheshire salt mines despatched large weights throughout the country by pack pony.

Only two miles from Colne, Lancashire, lies the lovely hamlet of Wycollar, with an attractive double-arched pack-horse bridge. It has lost its parapets, but it is a relic from the time when pony convoys passed that way between Yorkshire and Lancashire.

A still more interesting souvenir of pack pony days remains on the outskirts of Bakewell, Derbyshire, and is actually only a few yards from the busy Manchester-Nottingham main road, though few travellers along that major highway are aware of the existence of this historic treasure. It spans the River Wye, and is in fine condition.

It differs from most other packhorse bridges in design, for it consists of several arches and the way across it is perfectly level. But it is so narrow that recesses are provided over the cutwaters for the convenience and safety of pedestrians. Its official name is Holme Bridge, and it was built nearly 300 years ago for pack ponies going to Holme Hall, nearby.

Not all our packhorse bridges are known



**This packhorse bridge at Anstey, Leicestershire, can be seen from the main road connecting the village with Leicester.**

by their official name, however. A number of them bear nicknames, usually applied by reason of a local tradition or arising in some equally singular way.

Danby Bridge, over the Cleveland Esk, is more commonly known as Duck Bridge because it was once repaired by a George Duck. Yet the coats-of-arms carved on it are those of the baronial Nevilles, its one-time owners, for the bridge was erected in the Middle Ages, when that family owned properties in the neighbourhood.

Farther downstream is Beggar's Bridge, another structure built in pack pony days. Tradition says that a poor youth named Ferris often had difficulty in fording the river here, and he vowed that if ever he made a fortune he would build a bridge at this spot. He did become rich, and he kept his promise by paying for the structure that has since been known as Beggar's Bridge. It dates from 1619, and is on an old packhorse route through the Cleveland Hills.

Another engaging Leicestershire example is at Rearsby, between Leicester and Melton Mowbray. The stream which it spans is now a mere trickle, but in earlier centuries it was a more formidable barrier and the extremely narrow bridge standing today was a useful means of getting pack pony trains across.



**Beckfoot Bridge, near Bingley, Airedale. It was built for pack pony transport, and was much used by pony trains going to and from Scotland.**

A bridge dating from those times, but unique in design, straddles Oakdale Beck near Bilton, on the outskirts of Harrogate. It is a single-span bridge and lies on the old route from Knaresborough to Upper Nidderdale. Over this bridge came Charles I as a prisoner, on his way to Knaresborough Castle, where he was held for a time before being taken to London for trial.

Some old inns have memories of pack pony days. The Sun Inn at Kirkby Lonsdale, Westmorland, is in that class. It was frequented by drovers in charge of pony trains going to and from Scotland.

In the Shibden Valley, near Halifax, is another old inn which was used in those days by men accompanying ponies which brought cloth to the Piece Hall, Halifax. The route through the Shibden Valley is suitable only for light transport.

**New Zealand's Man-made Forests—**

(*Continued from page 298*)

of a large mill at Kawerau, about 24 miles east of Rotorua, for the production on a huge scale of woodpulp, newsprint and sawn timber. Thus a great new industry has been brought into being, which, as the Prime Minister, Mr. S. G. Holland, stated in his opening speech in October 1955, "is a milestone in our national economy, to be reckoned with the inauguration of the refrigeration industry seventy years ago."

This vast Kawerau project, involving a capital investment of about £36,000,000, has been completed in the amazingly short period of two years and is now running almost to capacity. It is so new, however that it is difficult for New Zealanders to grasp its immense importance. For it is only as recently as 17th November, 1955, that the first shipment of approximately 1,000 tons of unbleached kraft pulp left Kawerau for London, to be followed by a further large shipment a few weeks later.

When the new plant is in full production over 30,000 tons of kraft pulp a year will be sold in Australia, the United Kingdom and other markets, and should serve to help to overcome paper shortages to a considerable extent. In addition to this the Kawerau mill will turn out 73,000,000 board feet of timber, and 75,000 tons of newsprint.

Though the establishment of the newsprint mill at Kawerau is the most recent and by far the most spectacular, other large scale developments have been going on since 1939. The most important of these is at Kenleith, where the company owns a private forest of 176,000 acres. Commencing with ordinary saw-mill operations, the production of wall-board, kraft pulp and kraft paper were soon added, and the manufacture began of multi-wall paper bags, for cement, corrugated containers, and many other products from wood unsuitable for ordinary building timber.

# A Novel Summer Competition

## Meccano Models in Realistic Surroundings

DURING the summer most people like to spend as much time as possible out of doors, to make the most of spells of good weather, and with this in mind we are arranging a special competition that will enable model-builders to turn the time they spend outdoors to good advantage.

In this contest competitors are asked to submit photographs or drawings showing suitable models arranged in natural and realistic surroundings. An example of the type of picture we have in mind appears in the illustration at the top of this page, which shows a Meccano locomotive emerging from a realistic tunnel mouth.

There are many other models that can be arranged in effective scenes and competitors should not find it difficult to prepare an attractive entry. For example a Meccano bridge spanning a river, an excavator at work on a building site, or even a building under construction will provide plenty of scope for an entry to this competition.

It is not necessary to build a new model for the contest. There must be at least one model in the picture of course, but a suitable model already built or one under construction can be used. The main thing is to arrange the model or models in surroundings as realistic and as natural as you can devise. You can use any materials you like to build the scene, which can be of any size and kind as long as a Meccano model is an essential feature of it.

While it is summer in this country, we realise that some of our Overseas readers may not find conditions so pleasant out of doors just now, and it is not essential to arrange the scene in the open. If they wish they can make a suitable scene indoors on the lines of the layouts illustrated in the Dinky News pages.



**A Meccano model locomotive photographed in realistic outdoor surroundings, by David C. Mead, Stoke-on-Trent, who was a prizewinner in a former "Realism" Competition of the kind announced on this page.**

For this contest photographs are preferable, but drawings will do if good clear photographs cannot be obtained. The model and its setting must be the result of the competitor's unaided efforts, but it is not necessary that the photographs or drawings should be prepared by the entrant.

There will be two Sections in this contest: Section A, for competitors who will be under twelve years of age on 30th September, 1956, and Section B for competitors who will be twelve or over on that date.

Details of the prizes to be awarded in each section are given in the panel on this page. Each competitor must write his age, name and address clearly on the back of his entry.

Entries should be addressed *Meccano "Realism" Competition, Meccano Ltd., Binns Road, Liverpool 13*, and must be posted to reach this Office not later than 30th September, 1956.

**THE PRIZES**

**The following prizes will be awarded in each of the Sections A and B.**

| | £ | s. | d. |
|---|---|---|---|
| First Prize, Cheque for .. .. | 4 | 4 | 0 |
| Second Prize, Cheque for .. .. | 2 | 2 | 0 |
| Third Prize, Cheque for .. .. | 1 | 1 | 0 |
| Ten Prizes, each of .. .. | | 10 | 0 |
| Ten Prizes, each of .. .. | | 5 | 0 |

# Among the Model-Builders

By "Spanner"

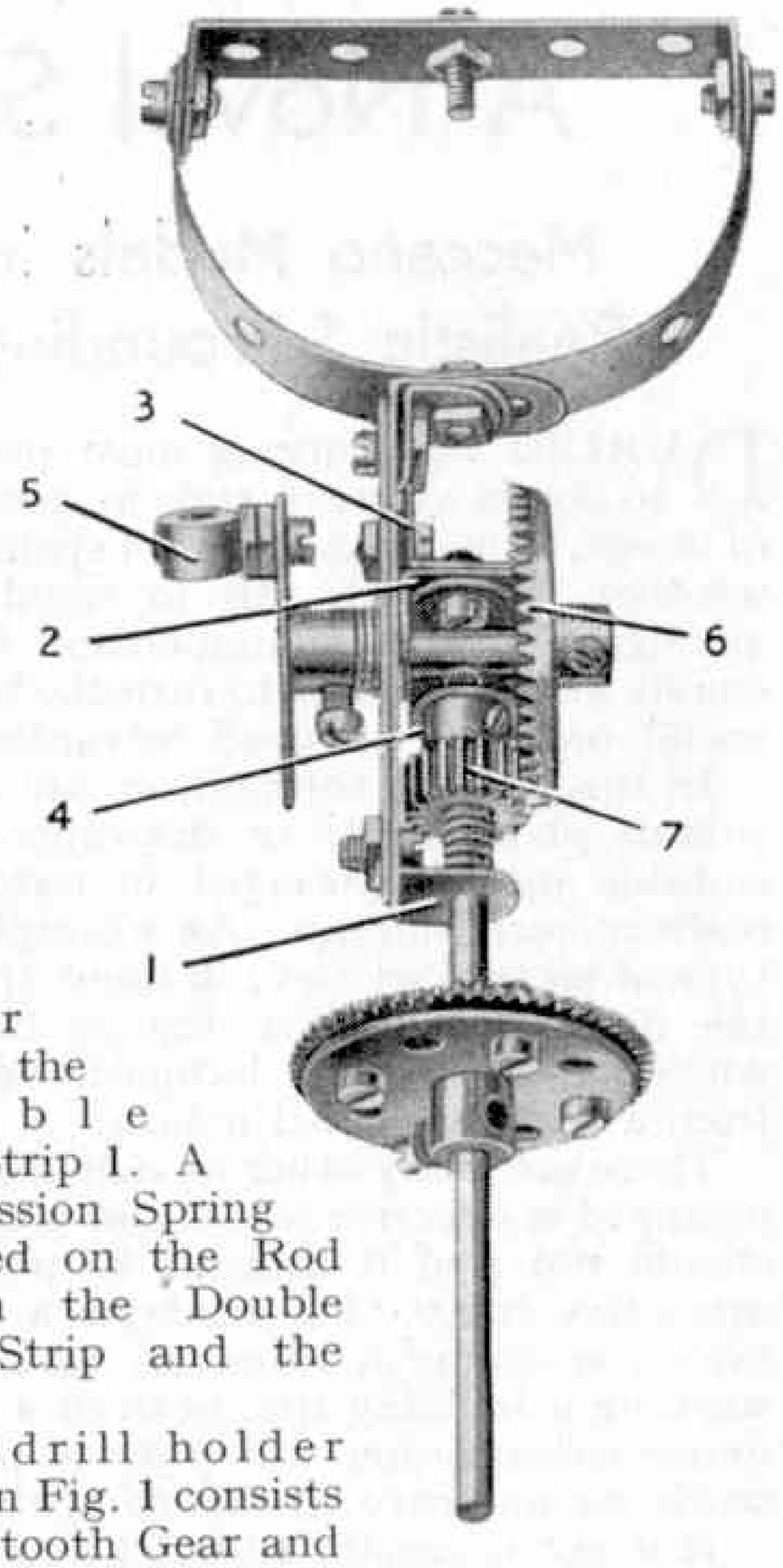



**Fig. 1. A small hand drill made from Meccano parts.**

## Small Hand Drill

The simple model illustrated in Fig. 1 is a small hand drill built by Master T. Shannon, Kilbrush, Eire, who says he has found it very useful for drilling holes in thin wood.

A $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 1 forms the main support for the drill shafts and to one lug of this part are bolted two Formed Slotted Strips connected by a further $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. The lug of the Double Angle Strip 1 is strengthened by an Angle Bracket fixed in place as shown.

Two Angle Brackets are bolted tightly together to make a U-shaped bracket 2, and a further Angle Bracket 3 and a Double Bracket 4 are held in place by the same bolt. The Angle Bracket 3 is bolted to the Double Angle Strip 1 but is spaced from the Double Angle Strip by a Washer on the bolt. A $2\frac{1}{2}''$ Strip is fixed to the outer face of the Double Angle Strip and serves to strengthen this part.

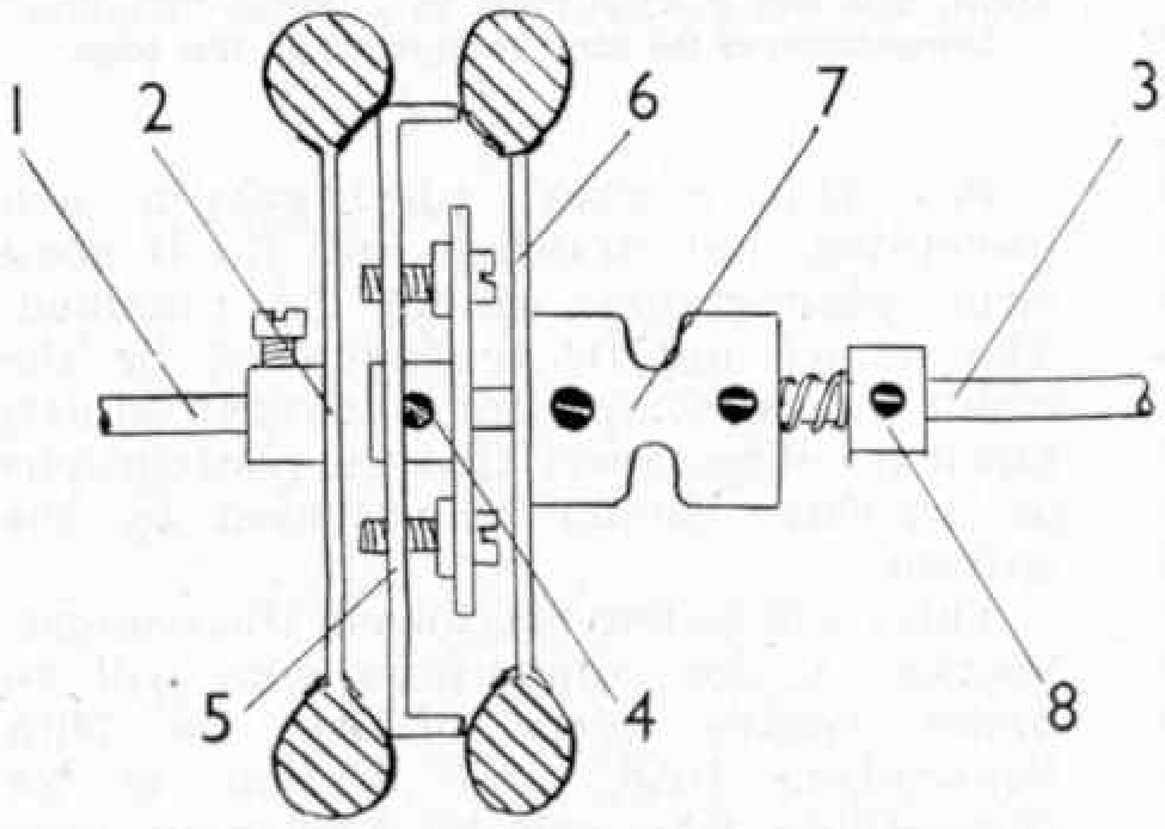



**Fig. 2. The heavy-duty clutch mechanism described on this page shown in diagrammatic form.**

The handle 5 is a Collar screwed tightly on to the shank of a $\frac{3}{8}''$ Bolt that is lock-nutted in a Bush Wheel. The Bush Wheel is fixed on a $1\frac{1}{2}''$ Rod supported in the Double Angle Strip 1 and the bracket 2, and this Rod carries also a $1\frac{1}{2}''$ Contrate 6. The Contrate drives a $\frac{1}{2}''$ Pinion 7 fixed on a 2" Rod mounted in the Double Bracket 4 and the lower lug of the Double Angle Strip 1. A Compression Spring is placed on the Rod between the Double Angle Strip and the Pinion.

The drill holder shown in Fig. 1 consists of a 57-tooth Gear and a Bush Wheel bolted together, the Gear being fixed on the lower end of the Rod that carries the Pinion 7. This arrangement was used because the Gear and the Bush Wheel were the most convenient parts available to the builder, but of course they can be replaced by a Coupling if desired. In the picture the drill is represented by a 2" Rod held in the Bush Wheel.

## Heavy-Duty Clutch Mechanism

Fig. 2 shows a sketch of a neat friction clutch mechanism designed by Mr. A. H. Palmer, Manchester. The input shaft 1 is driven by the engine unit and carries a 2" Pulley 2 fitted with a Motor Tyre. The output shaft 3 supports a Bush Wheel 4 fixed in position at the end of the shaft by means of a small Grub Screw. Two $\frac{3}{8}''$ Bolts are fixed by nuts in the Bush Wheel, and are passed through holes in a Wheel Flange 5.

A second 2" Pulley 6, also fitted with a Motor Tyre, is freely mounted on shaft 3, and a Socket Coupling 7 is attached to the boss of this Pulley. A Compression Spring is held in place by Collar 8.

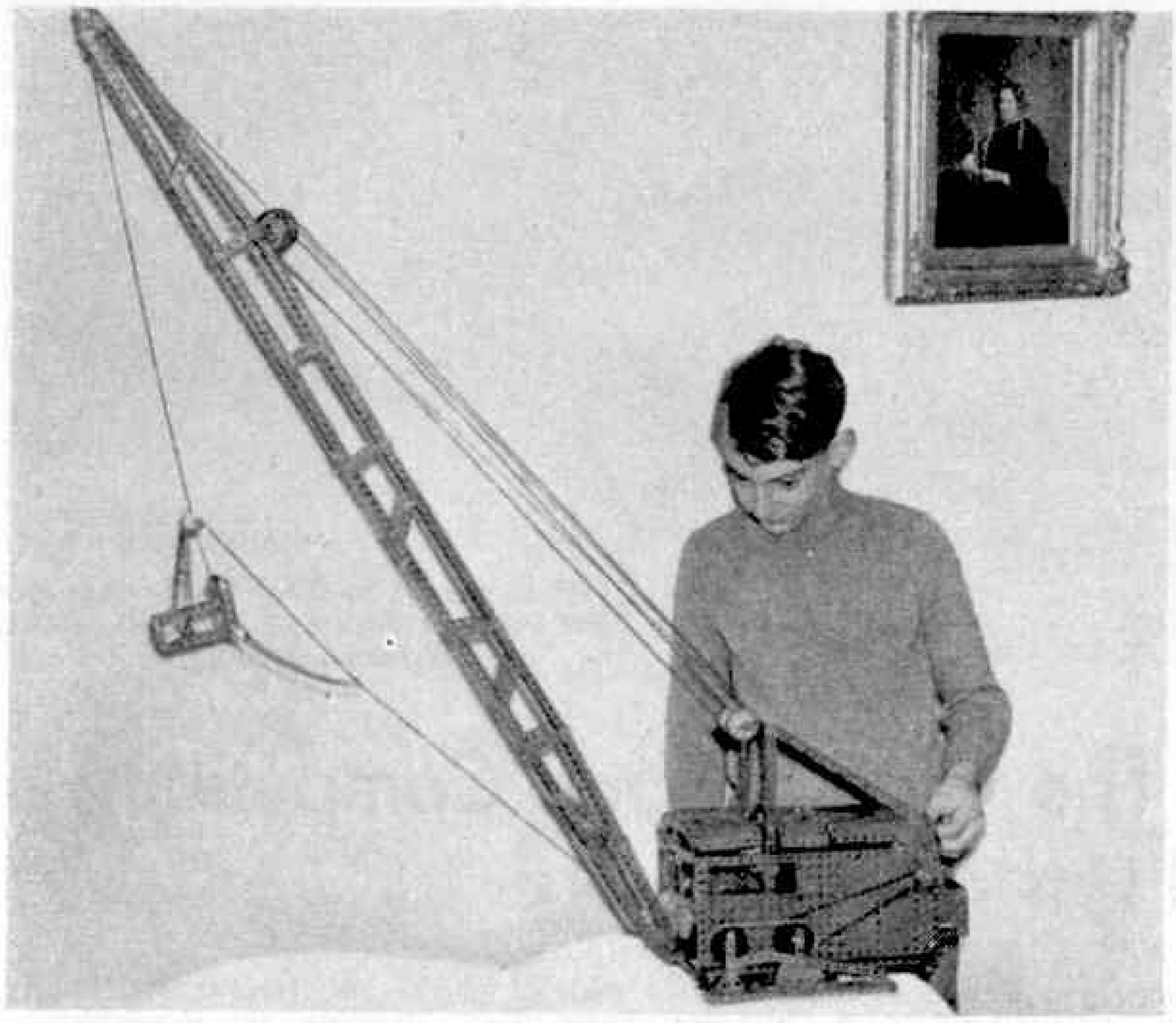


**Fig. 3. Master M. David, Watford, and his fine Walking Dragline.**

When the clutch is engaged the Wheel Flange **5** is clamped tightly between the Tyres on Pulleys **2** and **6** by the action of the Compression Spring. To disengage the clutch the Socket Coupling and Pulley 6 are withdrawn against the Compression Spring by means of levers located in the groove of the Socket Coupling. This action allows the Wheel Flange to move away from the Tyre on Pulley **2** and thus disengage the drive between shafts 1 and 3.

### A Fine Walking Dragline

The Walking Dragline illustrated in Fig. 3 was built by Master M. David, Watford, who is shown operating the controls of his model. Readers who have seen the Meccano No. 9 Outfit Instructions Book will realise that in general appearance this model is similar to the Walking Dragline described in that Book. Mechanically the model is very different however, for David is fortunate in possessing an extensive collection of parts and he has been able to modify the driving arrangements and the operating gear considerably.

The main differences are in the Motor reduction gearing, the walking mechanism and the design and operation of the bucket. The base also has been modified and is larger than that of the No. 9 Outfit model. The Walking Dragline is driven by a Meccano Clockwork Motor, and all the control handles are grouped conveniently at the rear of the cab so that the operator can reach them easily. The model is very powerful and will carry out all the main movements of the real machine. David is to be congratulated on the neat and effective way in which he has modified the Outfit model to incorporate additional movements and thus make good use of his extra parts.

### A Simple Cam Mechanism

In the simple Meccano cam mechanism shown in Fig. 4 the cam consists of two 2½" Curved Strips bolted to a Face Plate 1. A Fork Piece on Rod 2 bears ½" Pulley 3 on a ½" Bolt. The Pulley bears against the edge of the cam, and Compression Springs on the Rod 2 serve to keep the Pulley in contact with the cam. It will be seen that as the cam rotates, it imparts a reciprocating movement to the Rod 2. The extent and duration of this movement can be varied by adjusting the positions of the Curved Strips, thus altering the shape of the cam.

A smaller cam consists of a Pawl without boss, bolted to a Bush Wheel.

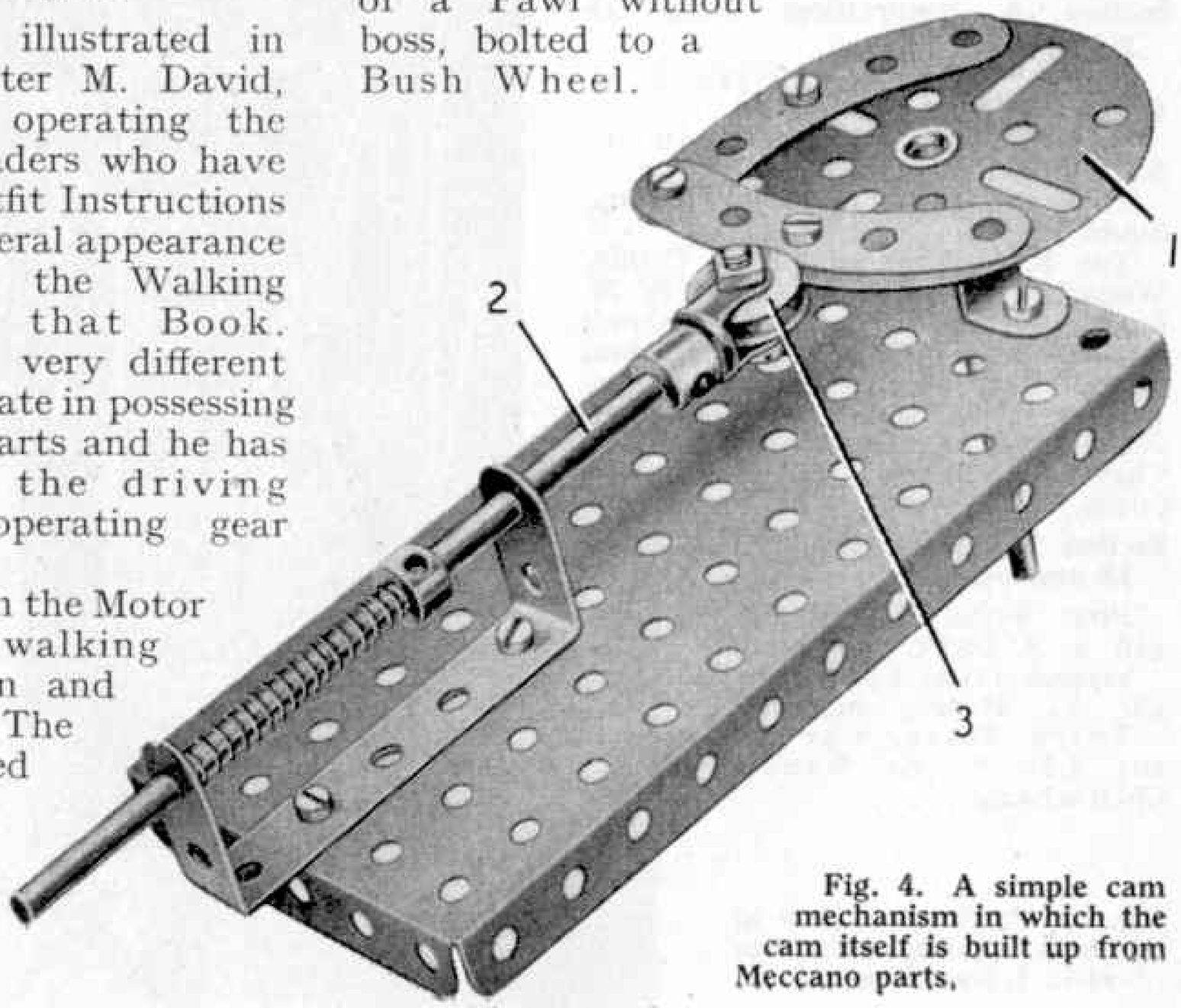



**Fig. 4. A simple cam mechanism in which the cam itself is built up from Meccano parts.**

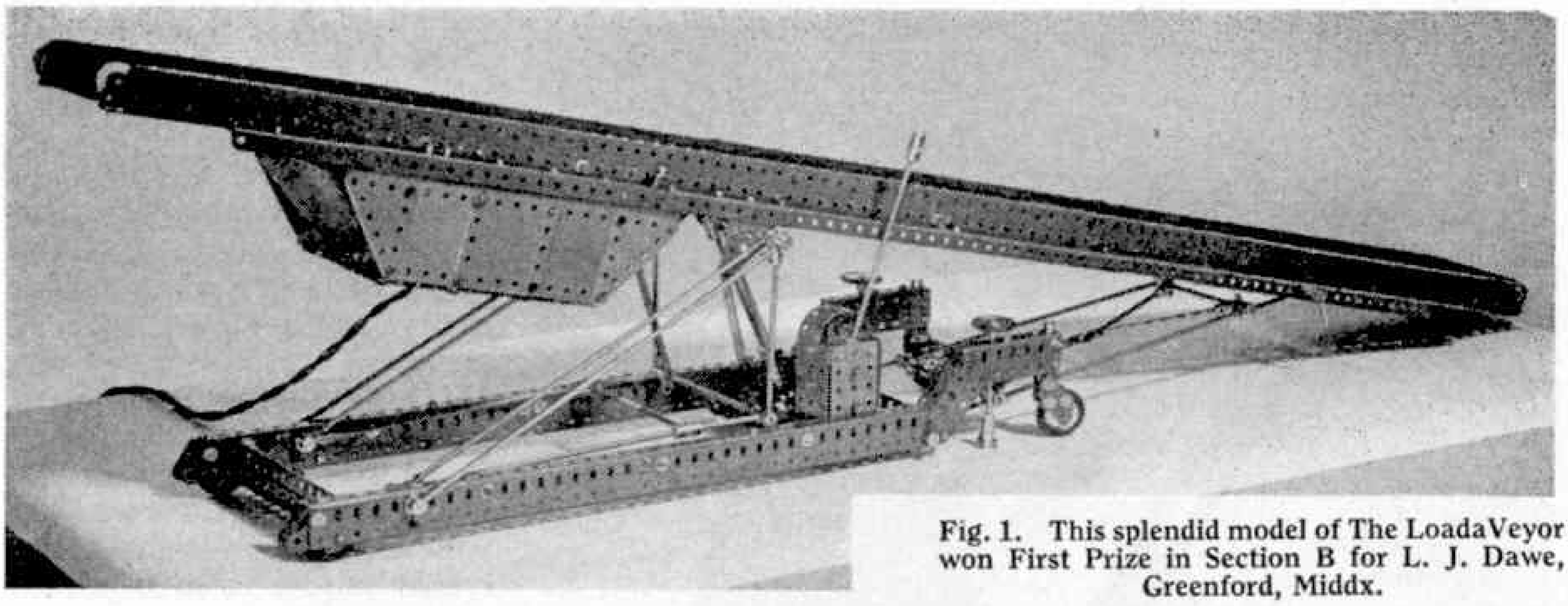


**Fig. 1. This splendid model of The LoadaVeyor won First Prize in Section B for L. J. Dawe, Greenford, Middx.**

# Fine Entries in The LoadaVeyor Competition

## Full Lists of Prize-winners

THIS month we are able to announce the results of the special Meccano Model-Building Competition in which splendid Cash Prizes were offered for the best Meccano models of The LoadaVeyor, a sturdy mobile load conveyor manufactured by Messrs. J. Collis & Sons Ltd., London. These prizes were offered by Messrs. J. Collis & Sons Ltd. and Meccano Ltd. jointly, and their allocation was by joint agreement.

The full lists of awards are as follows:

**Section A (competitors under 15 years of age).**

First Prize, Cheque for £10: D. C. Bretton, King's Lynn.

Second Prize, Cheque for £6: E. Schiltz, Luxembourg.

Third Prize, Cheque for £4: J. Byers, South Ruislip.

Ten Prizes each of £2: B. Griffin, Walsall; A. Ross, B.A.O.R. 11; M. Grant, Upper Hutt, New Zealand; C. Santuary, Wolverhampton; M. Ash, North Tawton; R. P. Bainbridge, Belfast; D. C. Fenner, Glasgow; J. S. Knowland, Londonderry; G. K. Chatterjie, Calcutta 6; P. Bexfield, Luton.

**Section B (competitors aged 15 and over).**

First Prize, Cheque for £15: L. J. Dawe, Greenford.

Second Prize, Cheque for £8: E. Henry, Sheffield.

Third Prize, Cheque for £5: F. S. Rouse, Cheltenham.

Ten Prizes each of £3: H. W. Henry, Rochester; A. Morales, Leon, Gto., Mexico; M. Rosenbloom, London E.18; H. H. Taylor, Huddersfield; F. A. Worcester, London N.W.9; A. H. Spinks, Liverpool 16; H. L. Thomas, Herne Bay; W. Halsall, Burscough; E. H. Chandler, Stratford-on-Avon; G. E. Rudings, Fish Hoek, South Africa.

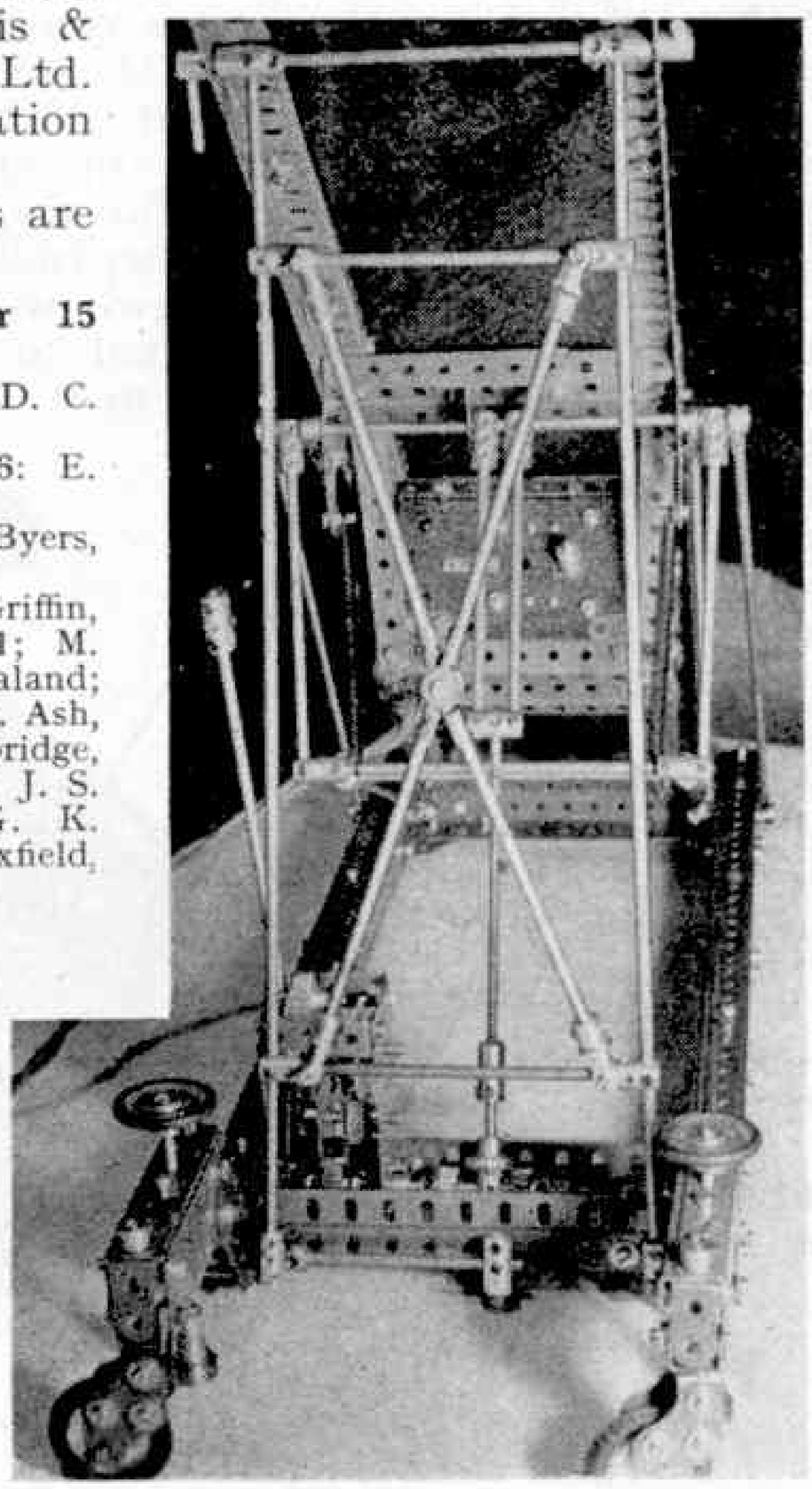


**Fig. 2. A close-up view of the boom adjusting mechanism of L. J. Dawe's model.**

It is evident from the entries received that this Competition provided model-builders with a fascinating subject to test their ingenuity and skill. The LoadaVeyor is not the easiest appliance to reproduce with Meccano, owing to the fact that in the actual LoadaVeyor the mechanism for adjusting the angle of the boom is operated by a small hydraulic unit. Therefore each competitor had to devise a satisfactory substitute for this which he could build from Meccano parts. Most of them adopted a screw and ratchet arrangement, and some of the resulting mechanisms were remarkably neat and ingenious. Indeed the general standard of model-building was exceptionally high,

and not only the prize-winners but those whose efforts just narrowly failed to bring them success deserve the highest praise for their skill and ingenuity.

Owing to lack of space it is only possible to illustrate a few of the models that gained the higher awards. First Prize in Section A was won by D. C. Bretton, King's Lynn, with the well-proportioned and detailed model shown at the top of this page. This model is powered by an E20R Electric Motor, and the driving mechanism and the belt-tensioning arrangement follow the design of the real LoadaVeyor very closely.

The hydraulic mechanism of the prototype is reproduced in Bretton's model by an arrangement rather different from the screw devices employed by most competitors. Bretton used a neat and effective ram mechanism operated by cord, which is wound on a drum controlled by a reversible ratchet drive. The whole model is an example of careful design and skilful model-building, and is well worth the highest award in Section A.

Mr. L. J. Dawe, Greenford, the winner of the First Prize in Section B, submitted details of a really splendid model of The LoadaVeyor. A picture of this model and a detail view of the elevating mechanism appear on the opposite page. It is a large model, but the proportions and general design are exceptionally good, while the attention to detail is outstanding. The power unit is an E20R Electric Motor fitted with suitable reduction gearing. From the final stage of the gearing a Chain transmits the drive to the driving roller, which is adjustable to control the tension of the belt. The elevating mechanism of the model is screw-operated, and is controlled by a neat lever that works a ratchet arrangement built up to represent the actual Collis Hydraulic Unit.

Third Prize in Section B was awarded to Mr. F. S. Rouse, Cheltenham, for the fine model illustrated at the foot of this page. This model also is powered by an Electric Motor neatly housed at one end of the boom.

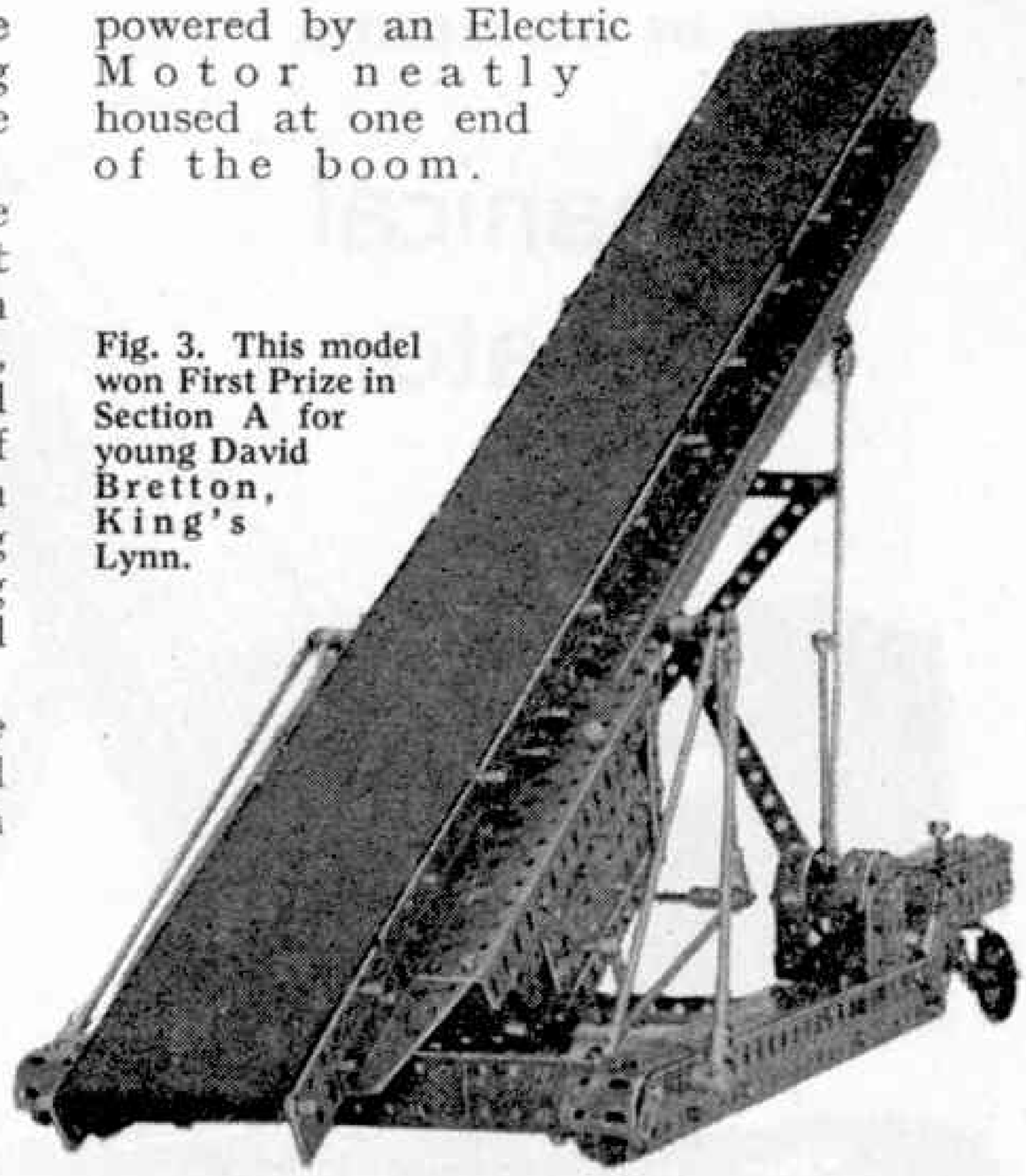


**Fig. 3. This model won First Prize in Section A for young David Bretton, King's Lynn.**

The elevating mechanism is screw-operated and the control lever is fitted with an ingenious double ratchet arrangement to provide drives for raising and lowering the boom.

Mr. E. Henry, Sheffield, whose model was awarded Second Prize in Section B, is a regular competitor in *M.M.* Competitions, and his model of The LoadaVeyor is well up to the high standard of his entries in previous contests. His model is neat and well-designed, and an interesting feature of the screw-operated conveyor elevator mechanism is that Mr. Henry makes good use of one of the recent additions to the Meccano range, the Screwed Rod Adaptor.

In view of the keen competition the winners have reason to be proud of their success.

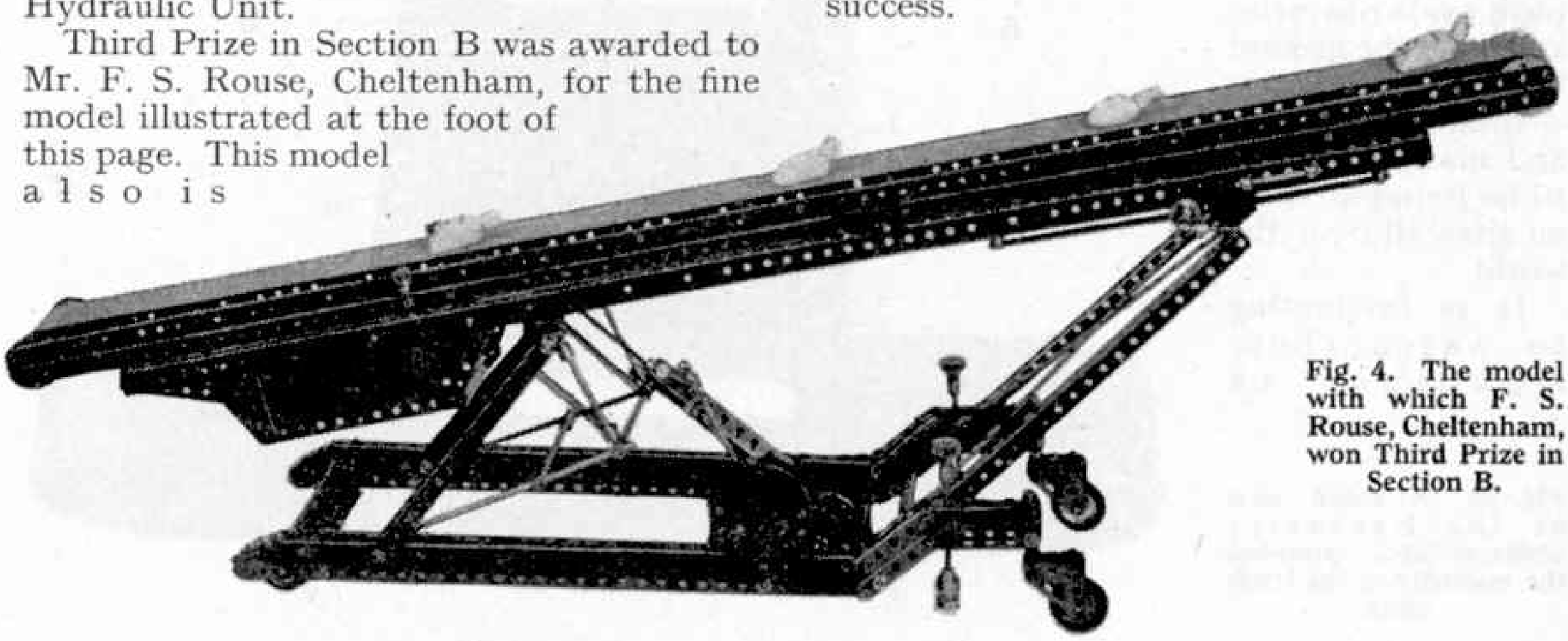


**Fig. 4. The model with which F. S. Rouse, Cheltenham, won Third Prize in Section B.**

**MODEL OF THE MONTH:**

# Mechanical Excavator

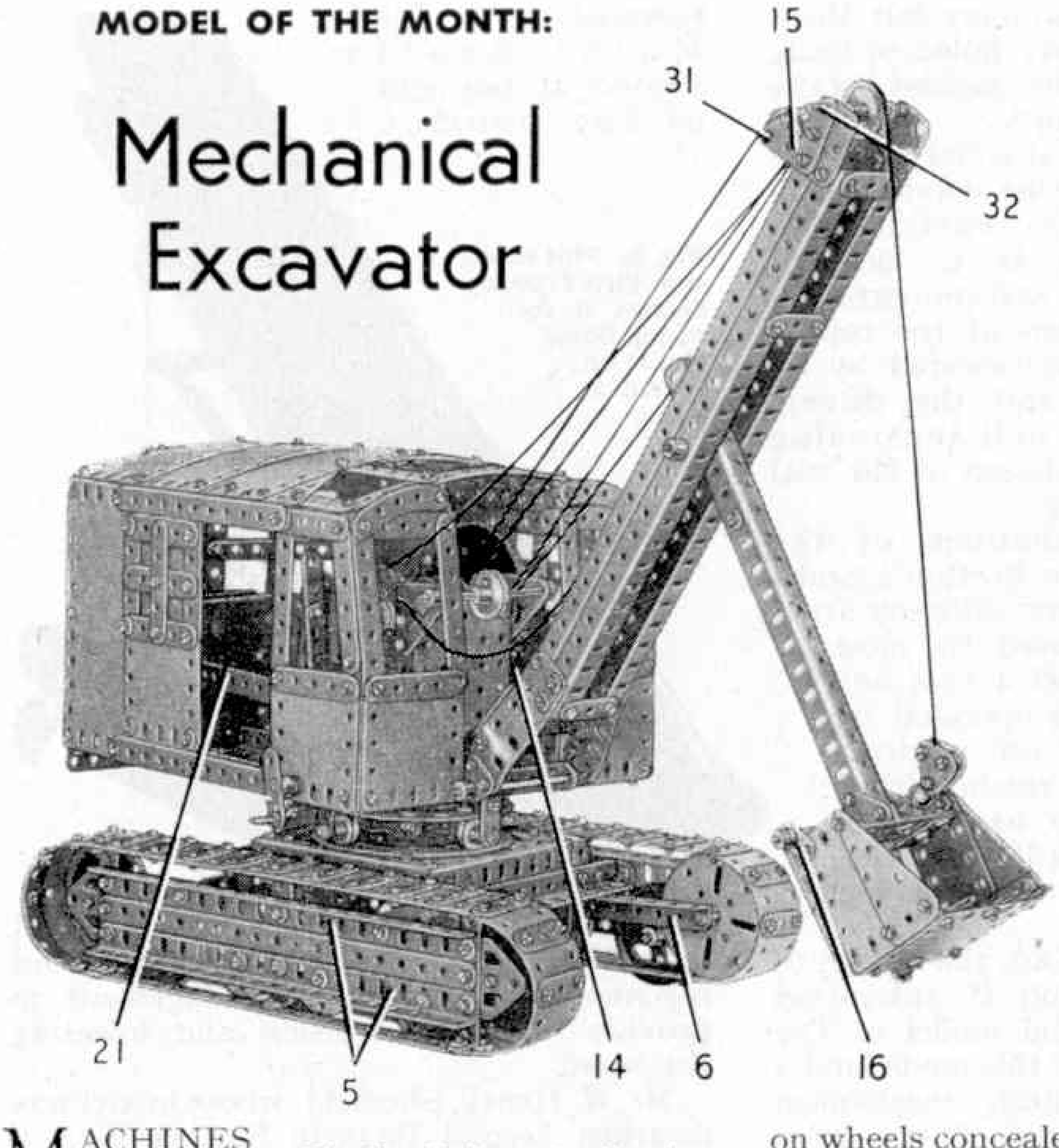



**Fig. 1. Full constructional details and a list of the parts required to build this splendid model Excavator can be obtained from the Editor.**

MACHINES of many different kinds are available to modern engineers and contractors to speed up site clearing and excavating operations. Excavators that will remove tons of spoil at a time, bulldozers that push aside obstacles and level the ground with apparent ease —these machines and many more are to be found at work on sites all over the world.

It is fascinating to watch these machines in operation, and most model-builders no doubt have stopped to follow the movements of an excavator as its bucket bit into the ground, and then swung round to empty its load of spoil into a waiting lorry or a dumper truck. Indeed, an excavator with its interesting movements and sturdy construction, makes an ideal subject for experienced model-builders, and this month we have chosen a typical one as our Model of the Month.

The Meccano model follows the original closely in its sturdy construction, with Angle Girders playing a big part in the design. In order to simplify it as much as possible the creeper tracks are represented by Flexible Plates and Strips, and the model is mounted on wheels concealed in the track assemblies.

An E20R (S) Electric Motor is mounted in the cab and this provides power for raising and lowering the jib and for

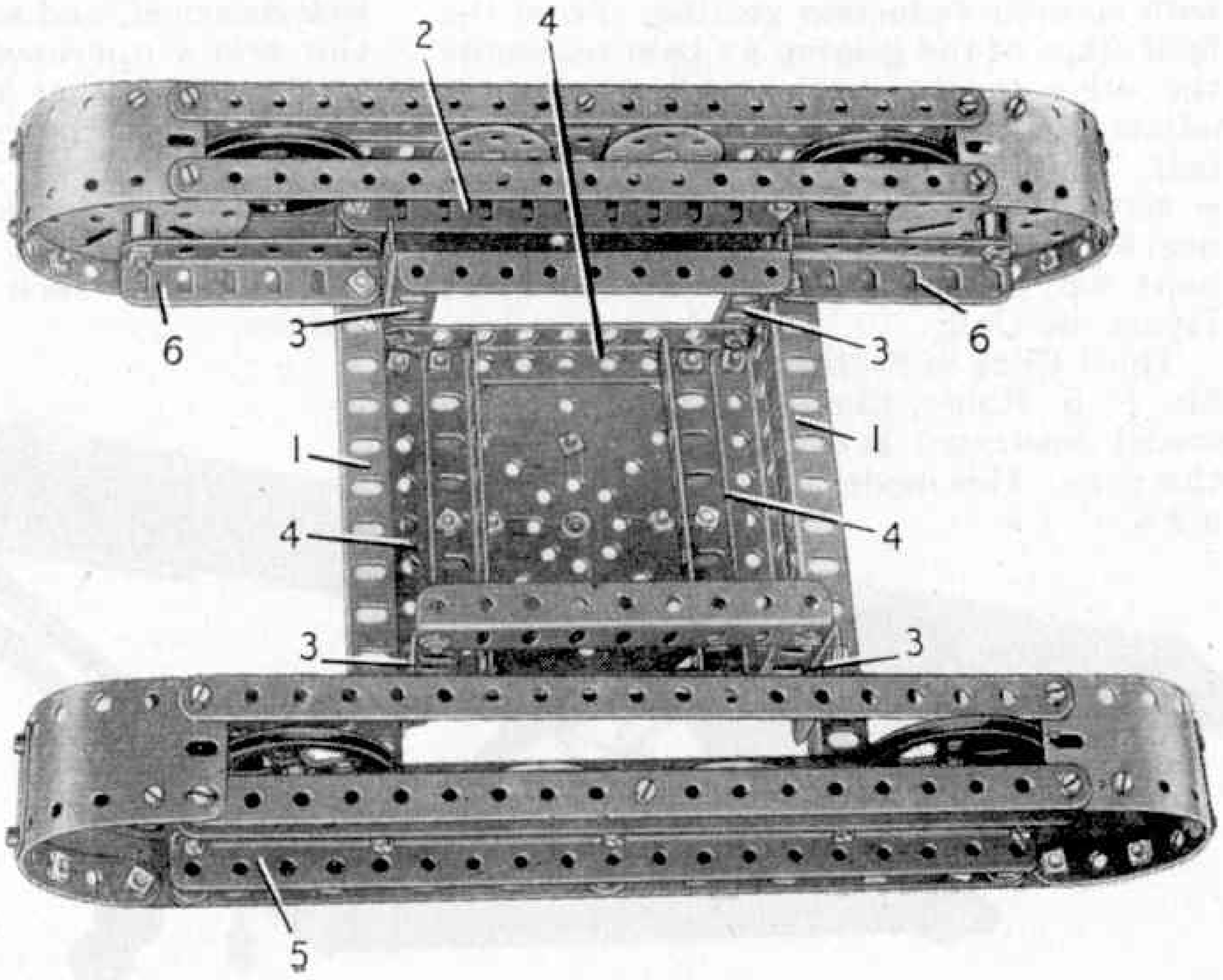



**Fig. 2. A detail view of the Excavator undercarriage, showing the assembly of the track units.**

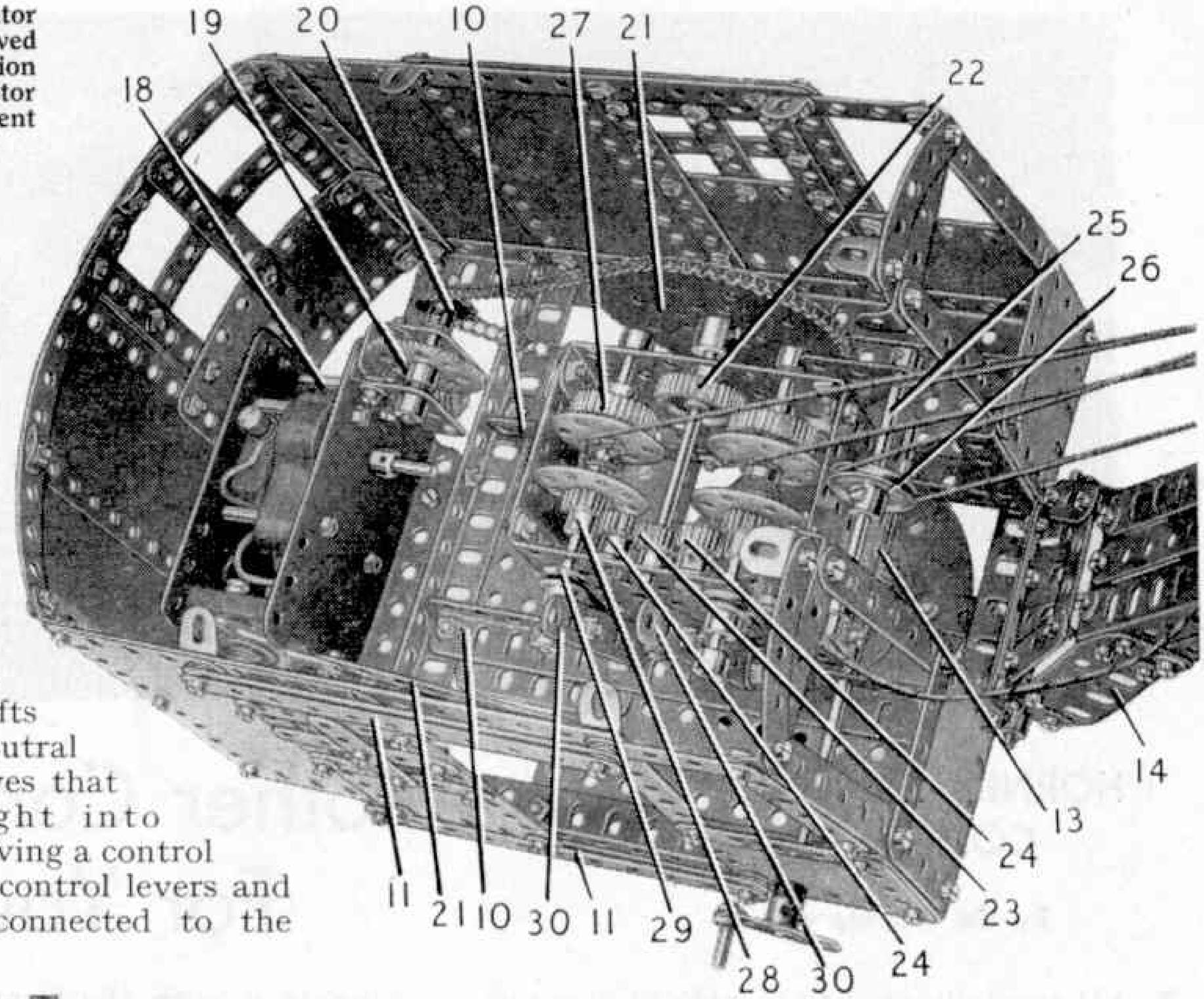
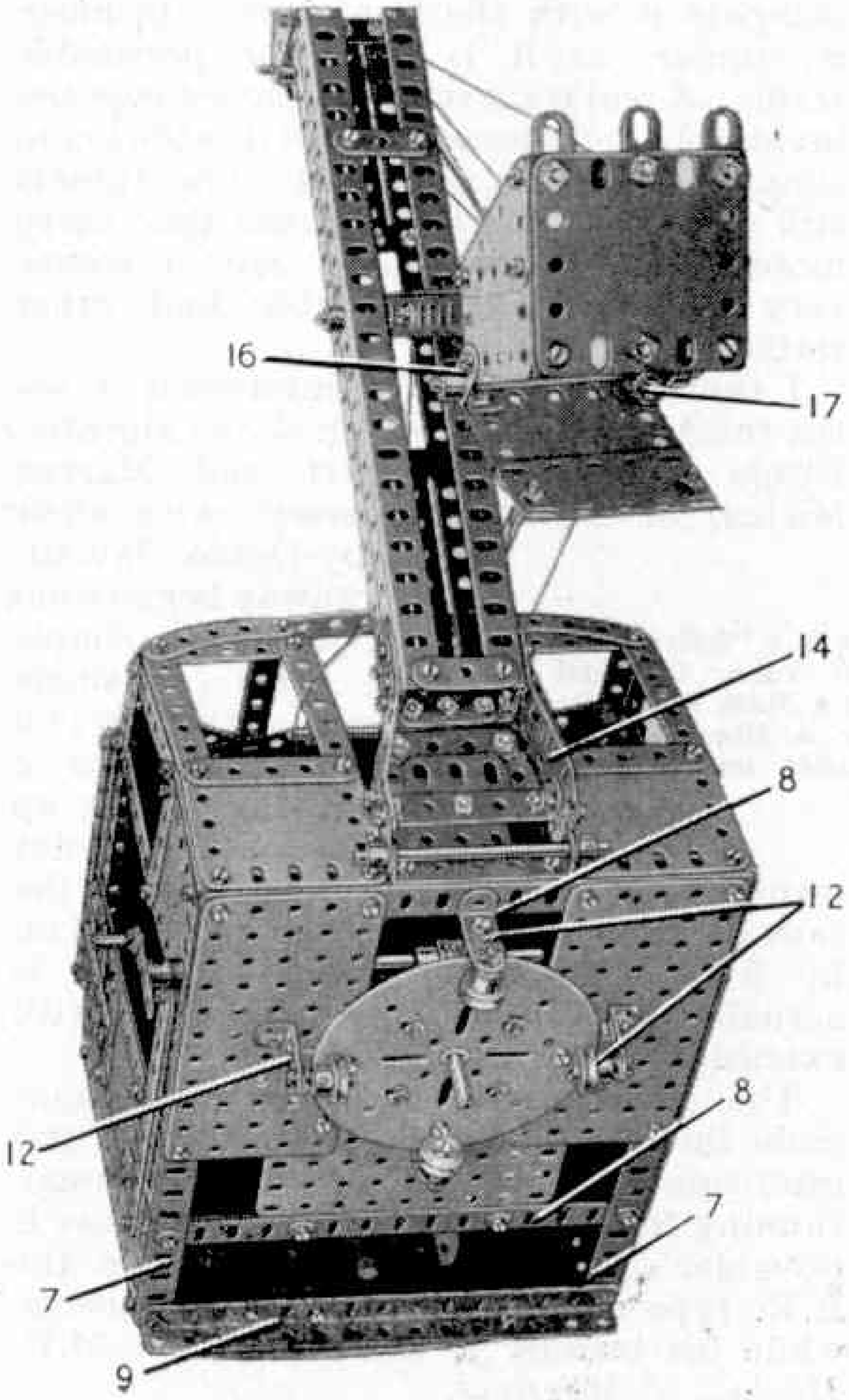



**Fig. 3. The Excavator with the roof removed to show the position of the Electric Motor and the arrangement of the gear-box.**

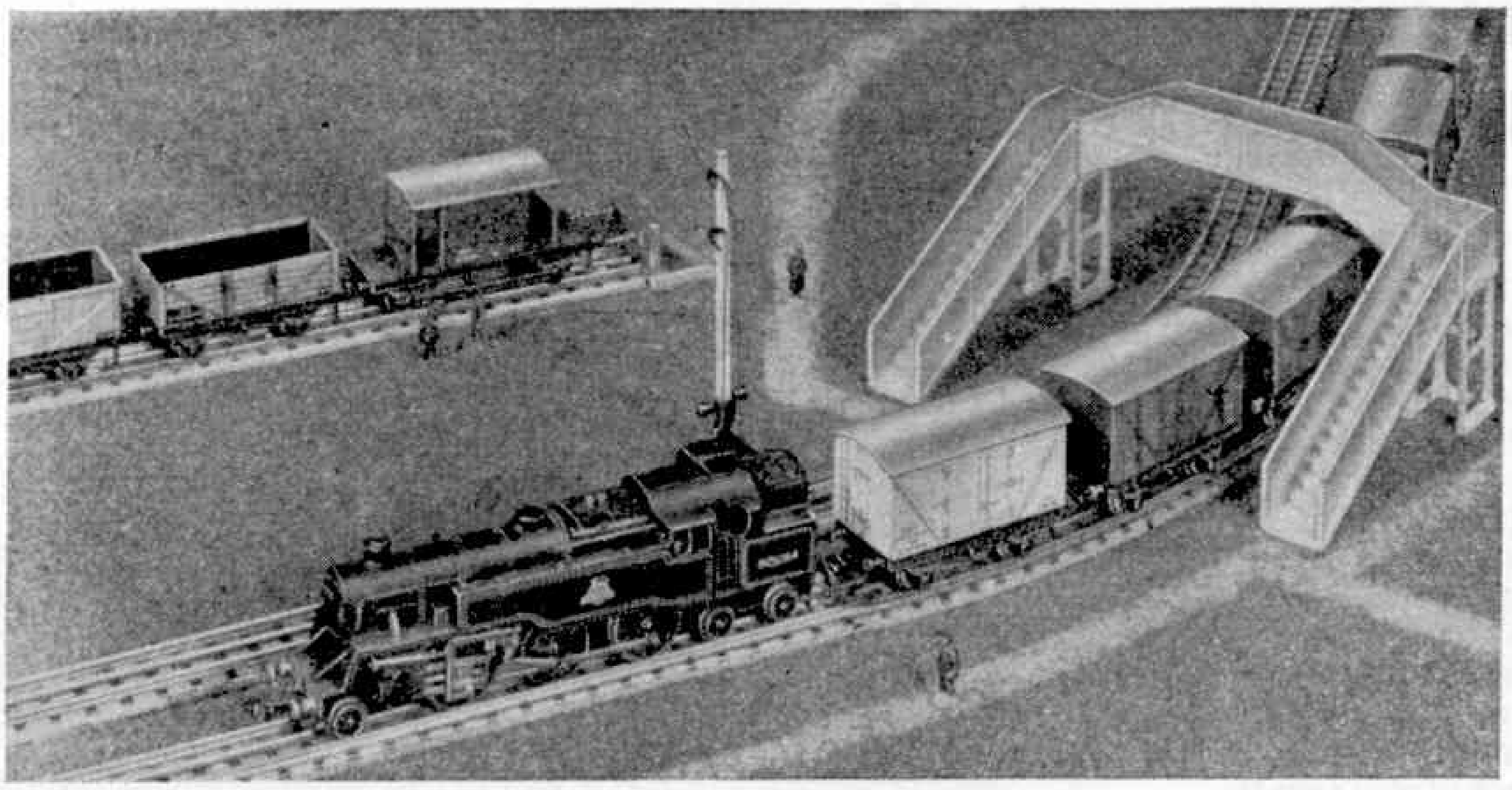
operating the digging movement of the bucket. These two power-operated movements are controlled through a simple gear-box with two winding shafts. Each of these shafts has forward, neutral and reverse drives that can be brought into operation by moving a control lever. The two control levers and a third lever connected to the Motor switch are grouped together, and can be reached easily through a sliding door at one side of the cab. A Cord that operates a simple catch on the bucket also is led into the cab. When this catch is disengaged a hinged flap fitted to the bucket is released and allows the spoil to be discharged. The slewing or rotating movement of the cab and jib is manually controlled.




The construction of the model can be divided into four convenient sections. First the undercarriage or base should be assembled, followed by the construction of the cab and its roller bearing. The next stage should be the assembly of the jib and the bucket with its supporting arm, and finally the Motor unit and the gear-box should be built and fitted in the cab.

If you would like to build this attractive working model, send a letter to the Editor mentioning "Model of the Month—Excavator." Full constructional details and a list of the parts required to build the model will then be sent to you free of charge. Please enclose a 1½d. stamp to cover postage.

**Fig. 4. This underneath view of the Excavator superstructure shows the roller bearing and the digger bucket in detail.**



HORNBY RAILWAY COMPANY

# Another Container For You

By the Secretary

I AM specially glad to be able to give you news of yet another Container and the upper picture on the next page shows very well indeed what it looks like. It represents the Insulated Meat Container used by British Railways for rail-road transport. Its appearance is distinctive, because it is finished in white, with the usual grey roof. Lettering and other details representing the side and end doors, strapping, and so on are carried out in black, and the Container loaded on the appropriate Low-Sided Wagon stands out prominently in a train of mixed stock.

The introduction of this Container will be of special interest to those who make a feature of running express freight trains. The Low-Sided Wagon on which it is loaded is the one in Bauxite finish, representing a brake-fitted vehicle and bearing the "*XP*" markings that indicate its suitability for fast running. It can, however, if necessary, find its place in the ordinary goods train.

The new Container on its wagon really comes into its own in the formation of a fully-fitted freight train composed for the most part of Containers only, with perhaps one or two of the standard Meat Vans. One of these Vans is shown next to the engine in the picture above, so you can compare it with the Container. Its finish is similar, as it is used for perishable traffic. A real train such as I have suggested invariably includes some vans in addition to containers. I am told that some traders still prefer to use vans because they carry more, although containers are of course very popular for perishable and other traffic nowadays.

I think you will all be interested to see the third illustration, which shows Hornby-Dublo enthusiasts Robert and Martyn Michel, of St. Peter, Jersey, with their Hornby-Dublo layout. This railway began some years ago as a simple track with a single siding, but with Father's help, and a good deal of saving up on the part of the joint owners, it has been possible to build up the railway on its present baseboard 8 ft. 6 in. by 5 ft. 3 in. Incidentally, the base is actually an old table-tennis table, with extensions for railway purposes.

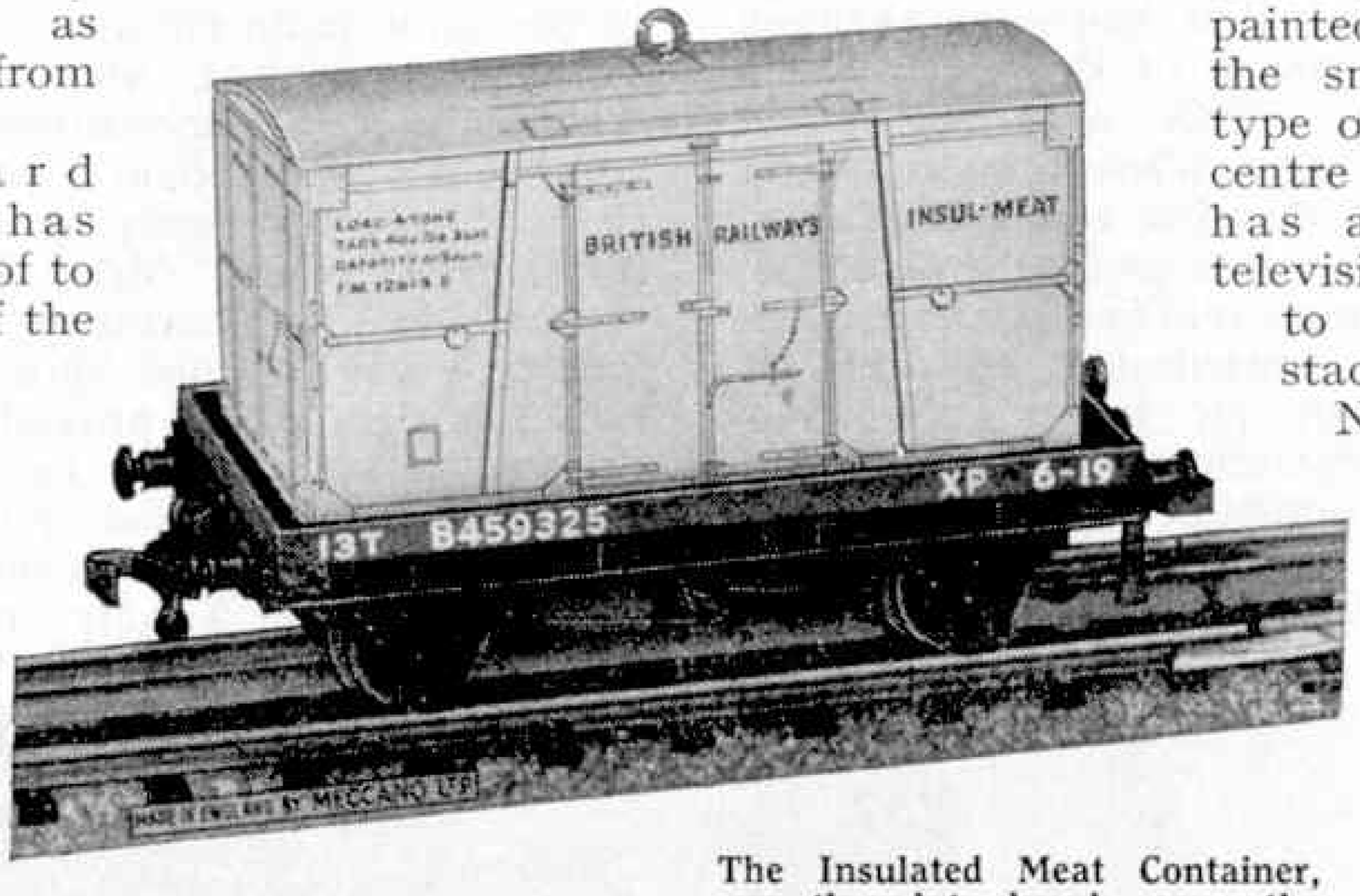
The railway now has two continuous main lines with various loops, sidings and interconnecting tracks, so that through running from one main line to the other is possible. As a rule, Robert operates the E.R. type streamlined 4–6–2 Locomotive, while his brother is the driver of L.M.R. *Duchess of Montrose*.

**At the head of this page is a "fully-fitted" train of Hornby-Dublo Vans, the first behind the engine being a Meat Van. The train is passing under a Hornby-Dublo Footbridge effectively sited on a curve.**

I expect that the lineside effects have attracted your attention. They are varied and not too crowded together, which is a good point because road traffic, which is quite heavy, has plenty of room to move on the road system. Dinky Toys form the bulk of the busy road vehicles, as you can see from the picture.

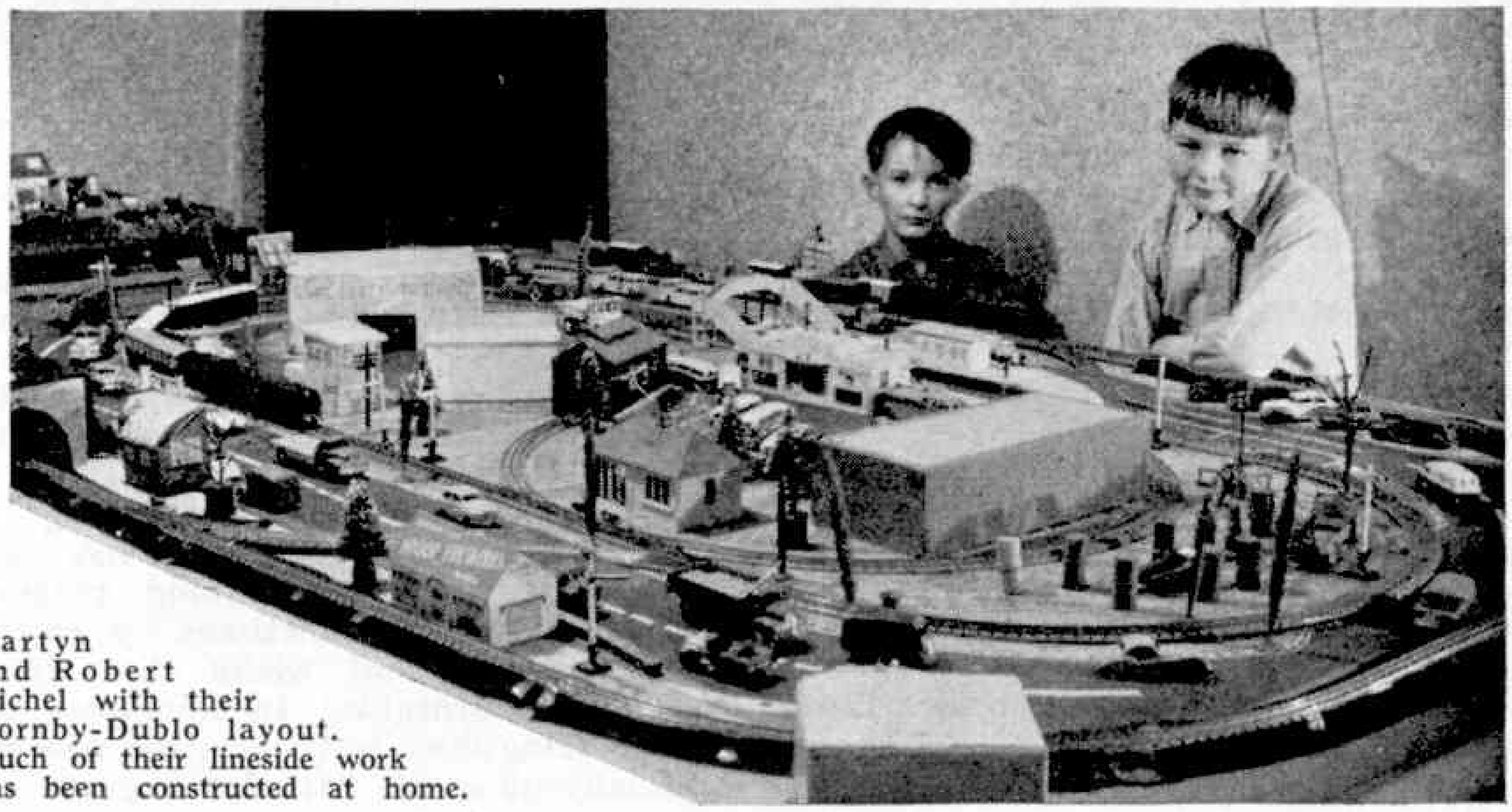
Cardboard modelling has been made use of to provide some of the buildings and also the tunnel, the mouth of which can just be seen at the left hand side of the picture. It is interesting to know that the miniature "poplar" trees seen here and there on the layout have actually been made from a type of grass that grows on the sandbanks locally in Jersey, the sprouting ends being dyed green and the "stalk" part of the cutting being bedded into a little base made of Plasticine. The other trees are twigs glued and treated with green dyed sawdust and other materials. You will notice that some of them at least are supported in cotton bobbins, which is not a bad idea, as these provide plenty of support and such "trees" are not easily knocked over.

Robert and Martyn are to be congratulated on their handiwork and attention to detail. They have provided quite successful telegraph poles made of balsa wood and matchsticks, the whole assembly being painted black, while the small bungalow type of house in the centre of the picture has a miniature television aerial fitted to the chimney stack.




**The Insulated Meat Container, recently introduced, on the Hornby-Dublo Low Sided Wagon.**

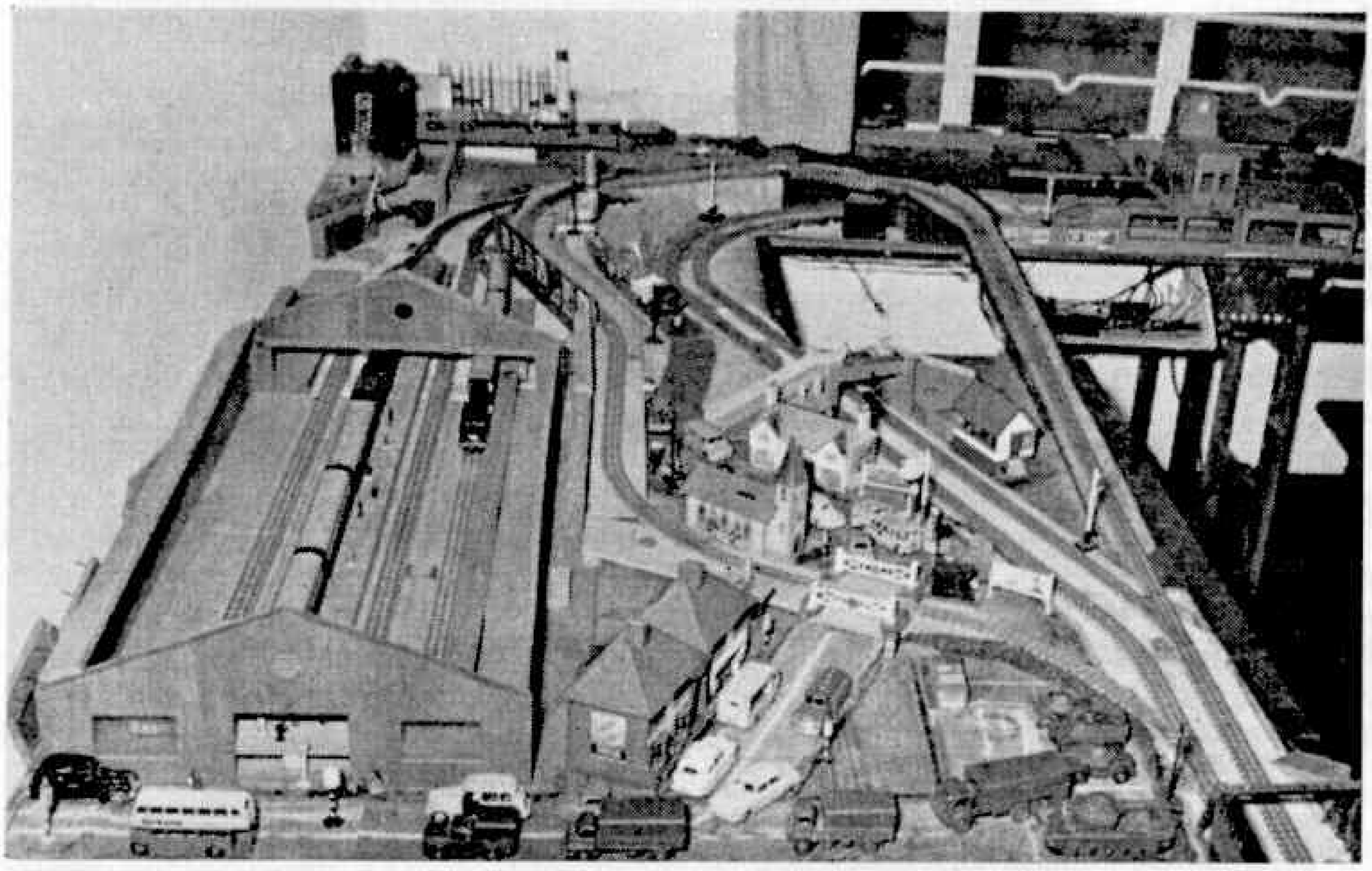
Not only has the making of these things been carried out with care, but the placing of them also has been done well. And this applies to the standard accessories, such as the Hornby-Dublo Through Station and the Footbridge that spans the track at the platform end. This situation for the Footbridge is quite a natural one that always looks good. Footbridges are not found in real practice only by stations; they can be seen along the line in many other situations, such as that shown in miniature in the illustration at the head of this article, where several pathways are joined by the Footbridge.



Martyn and Robert Michel with their Hornby-Dublo layout. Much of their lineside work has been constructed at home.

# A Family Layout in Hong Kong

HERE we have the story of a Hornby-Dublo layout that has gone through three separate stages of development in different places. This was begun by Mr. P. G. Pattinson, whose experience as an early H.R.C. member was gained with Hornby Gauge 0 trains and with Meccano. Now it has become a real family affair, as all members have contributed towards its building up—and all take a hand in operations. Scenic effects, especially some very fine backgrounds in water colour, have been produced by Mrs. Pattinson, and Nicholas, Stephen and Jimmy look after traffic movements by rail and road. Baby Jane so far is only in the stage of being a privileged lineside observer, a duty in which she shows the greatest enthusiasm.

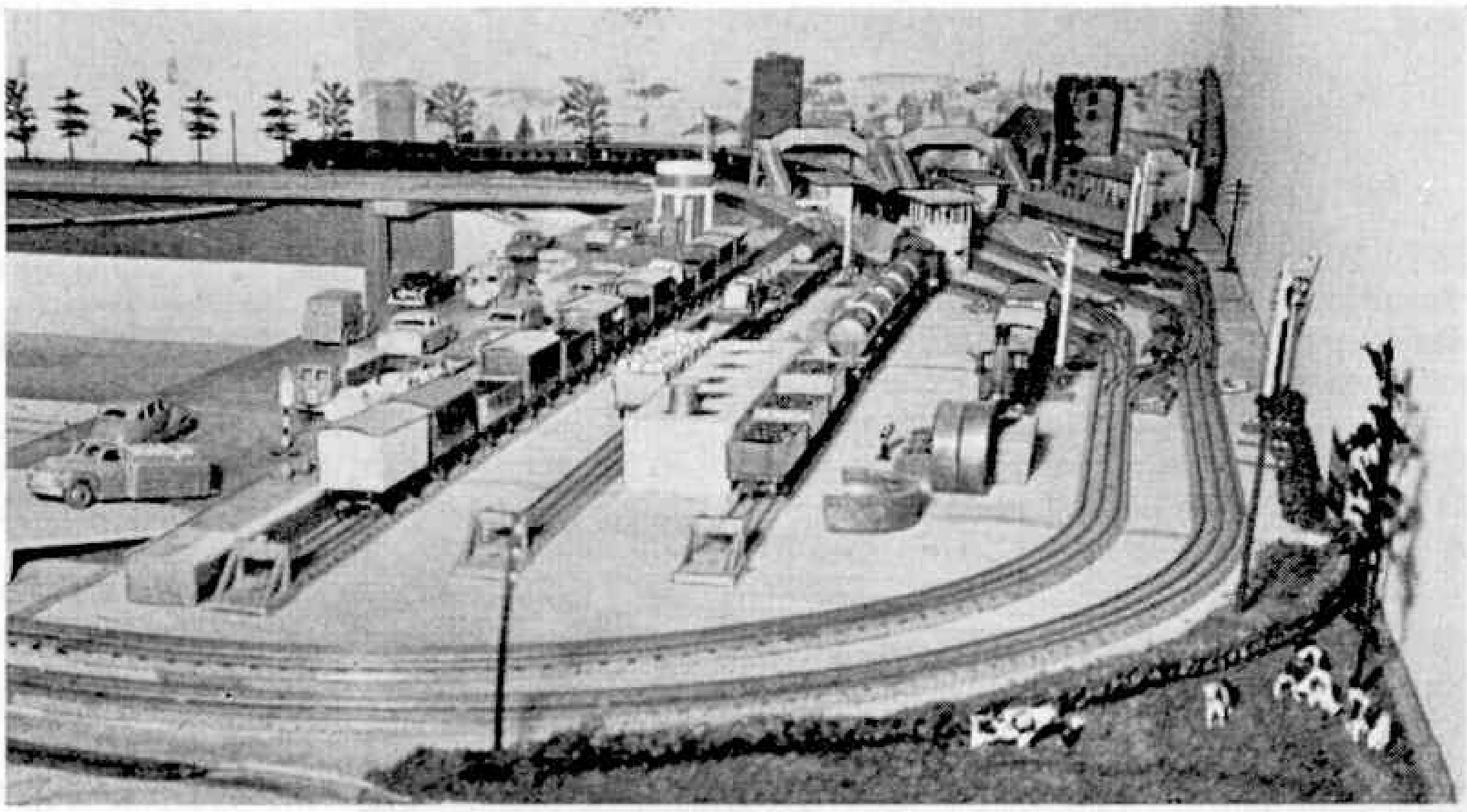


**From Hong Kong comes this interesting terminal view on the Hornby-Dublo layout of Mr. P. G. Pattinson, on which road and lineside effects have been specially studied. The photographs are by Willie's Studio, Hong Kong.**

The building up of the first layout soon showed the special advantages of Hornby-Dublo. Even in the early stages the main circuit was divided into successive electrical sections of convenient length, although only single track and one engine were then in service. This was found to be of considerable benefit later when a further track was laid outside the original one to form a double track main line. This division into sections proved of great advantage when any faults or short circuits occurred. In operation, the arrangement of the sections was such that an engine could be held "dead" at almost any desired spot on the line, when it became necessary to move another one in the same main circuit.

The first layout, like its most recent development, was accommodated on trestle type tables situated in a room that came to be known familiarly as the *Trainery*, a name for which Mrs. Pattinson was responsible. The entrance to this railway kingdom was spanned by a stout Meccano girder bridge, which proved fully equal to the task in spite of the natural hazards of its position. Meccano Parts also were used for the terminal station that formed part of the first layout and this station boasted a glass roof and side windows.

The necessity for turning the engines or even complete trains after arrival at the terminus led to the laying down of an "S"-shaped return loop of the type familiar to most Hornby-Dublo owners. Although the scheme worked, it was not considered entirely satisfactory, as the extent of the layout made quite a long journey necessary for engines or trains negotiating the "S" loop. Of course this sort of thing can happen in actual practice, too, and complicated trips for turning purposes have to be made sometimes by engines arriving at a point where there is no convenient turntable. In miniature this sort of thing does become rather irksome, especially on a line with few engines.



**The busy yard at "Westbury," inside the main line of Mr. Pattinson's layout.**

In its second stage the railway had to be accommodated within a more restricted space than before but another move resulted in the third and present stage of layout development, and two of our pictures show parts of the present system. This layout now has a whole room to itself and full advantage has been taken of this in planning and installation. The baseboard tables are of nice width and provide plenty of scope for engineering and lineside effects, as will be apparent from the illustrations.

Once again Meccano bridges span the gap between the tables in the room doorway. A double junction layout made possible by the introduction of a Diamond Crossing leads from the main line to the approach tracks to the terminus. Over a fair stretch of the system a four-track way has been provided, so that separate roads are available for fast and slow traffic in both directions. Needless to say, these sections have a really "main line" appearance. As with the former layouts, the system has been divided into a series of separate electrical sections and with the gradual introduction of Electrically-Operated Points, Signals and Uncoupling Rails a very good system of control is being built up.

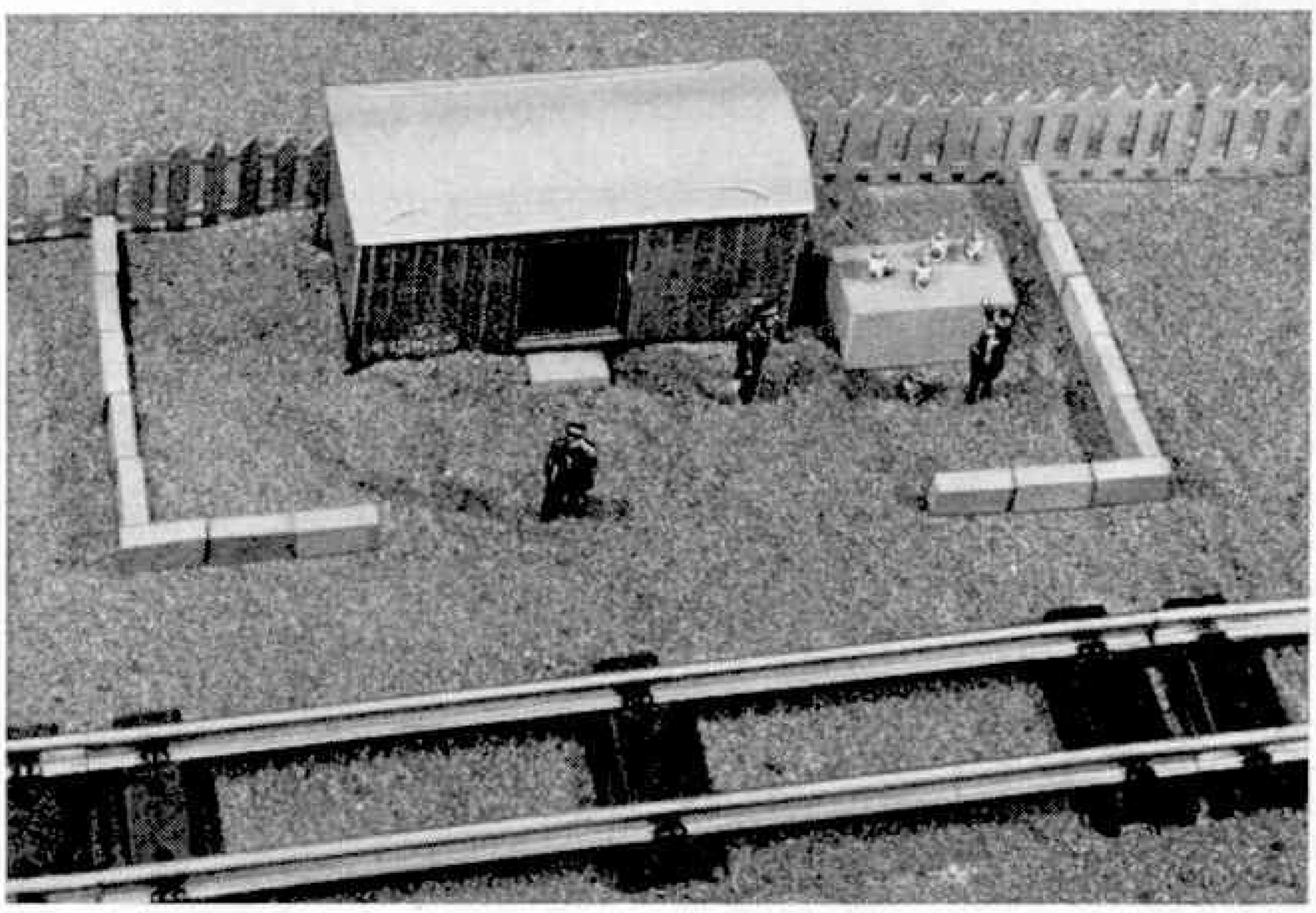
Of course such schemes mean a good deal of wiring and an interesting and realistic arrangement has been devised for carrying the feed wires alongside the track. Ordinary wire paper clips are bent to form two narrow loops, one above the other, with a short vertical length below and a right angle bend to form a short "foot," through which a wood screw can pass to attach the cable carrier thus formed to the baseboard. The feed wires are carried through the loops, with just the right amount of "sag" in the cables between the supporting points.



**This cheerful member of the Pattinson family is Stephen, photographed by the Meccano-built bridge on the first layout.**

# Hornby Train Lamps

MOST Hornby Train owners will be familiar with the miniature lamps that form part of the equipment of the Locomotives and Train Sets in the range from No. 40 upwards. The Engines, Tenders, Coaches and Vans of these Sets are all provided with lamp brackets in appropriate positions, and the lamps themselves can be lifted off. Their positions therefore can be changed as required. Having them where they should be adds a lot to the fun of train running, and anyway, we must have them in the right places if our trains are to be like the real ones.



**New lamps for old. A lineside store for Hornby Train Lamps arranged as suggested on this page.**

With certain exceptions in actual practice, the general purpose of headlamps is to show what class of train the engine is hauling, and all H.R.C. members will know that their booklet includes a diagram showing the different indications. The standard equipment for each No. 40, 50 and 51 Hornby Locomotive is two Headlamps, which are black with a silvery "glass," and one Tail Lamp, which is red, the latter for use when travelling light, or when backing out of a station at the end of a train. A tail lamp must be carried by all trains, and this lamp tells the signalman, who has to watch for it, that a train is complete.

As the last vehicle in a passenger train may not necessarily be the guard's Brake Van, Hornby No. 41 and 51 Passenger stock has lamp brackets for the Tail Lamp. And because suitable goods vans can run in passenger train formations the standard Hornby Vans—Milk, Refrigerator and so on—have lamp brackets as well.

In addition to brackets for tail lamps Hornby Goods Brake Vans have brackets for their special side lamps. These lamps are suitable only for this purpose. They are two-faced, painted to represent a white light showing ahead and a red light to the rear when mounted correctly on their brackets.

Apart from seeing that the lamps are used correctly, it is equally important for the Hornby train owner to see that none of them get lost. This *can* happen, because the lamps themselves are small and sometimes seem to have the knack of becoming immediately invisible if they drop on to the floor.

Instead of attempting to keep each set of lamps with the engine or brake van to which it belongs, it is not a bad idea to establish a sort of lamp "pool" to which all lamps must be returned after use. In the ordinary way they can be kept in a small box or tin, but while the railway is in use the owner may care to set up a sort of lamp depot, something like that shown in the picture on this page. Here, as often happens, a disused van body is used as a store hut, the lamps themselves being "cleaned and trimmed" on the bench outside. The bench is simply a block of wood and the little wall that encloses the store is made of small building blocks.

Do not forget your lamps may need their paint touching up from time to time. Smart well-kept lamps add a lot to the appearance of a miniature train.

# Club and Branch News

## WITH THE SECRETARY

### GETTING LINESIDE EFFECTS RIGHT

An interesting feature of H.R.C. Branch activities during last winter was the growing number of Branches that devoted certain meetings to designing and constructing scenic effects for their layouts. In some Branches members proved adept at this sort of thing; in others progress was less marked, but there was no lack of interest and enthusiasm.

Lineside effects, when seen in actuality, are so familiar that generally they are taken for granted instead of being studied, and thus some Branch members found themselves "stumped" when it came to designing and making miniatures of lineside accessories. The moral, of course, is to be more observant when out and about, and Branch outings—or, indeed, individual excursions or holiday travel—can be turned to good account by the Branch member who wishes to reproduce well the details of lineside scenery.

Find some corner of an old-world village or other attractive scene during your summer holiday, and roughly sketch the essential details to provide a "working plan" for next winter.

## CLUB NOTES

HORNSEA M.C.—Meetings have been very well attended, and on the occasions when the programme for the evening has been decided by a card vote Meccano model-building has topped the list. Games—especially table-tennis and Monopoly—continue to be very popular, as also are film shows. At Saturday evening table-tennis meetings members are allowed to bring a friend who is not yet old enough to join the Club, but who, on becoming 12 years old, may like to do so Club roll: 11. *Secretary:* A. W. Ings, Carlton Lodge, Cliff Road, Hornsea, E. Yorks.

CONSETT AND DISTRICT Y.M.C.A. M.C.—The track on the Club layout is now complete, and electrification is being put in hand. A high level roadway with a railway siding passing underneath is to be added to the layout shortly. A competition in which the members are asked to plan and build a model of "anything mechanical" is in progress. Club roll: 30. *Secretary:* B. Ward, 10 Cyril Street, Number One, Consett, Co. Durham.

### AUSTRALIA

MAYLANDS M.C.—The Club year began on 18th February last, and one third of this year's members are newcomers who include youngsters of nine or ten years old. The Leader decided to open the Club on Saturday mornings, and the scheme has worked very well. Several large models are being built. The younger members have done well with smaller models, and show great promise. The Leader has made a cabinet for the Club record library. Club roll: 40. *Secretary:* W. Miles, 6 Piaggio Street, Bayswater, Perth, Western Australia.

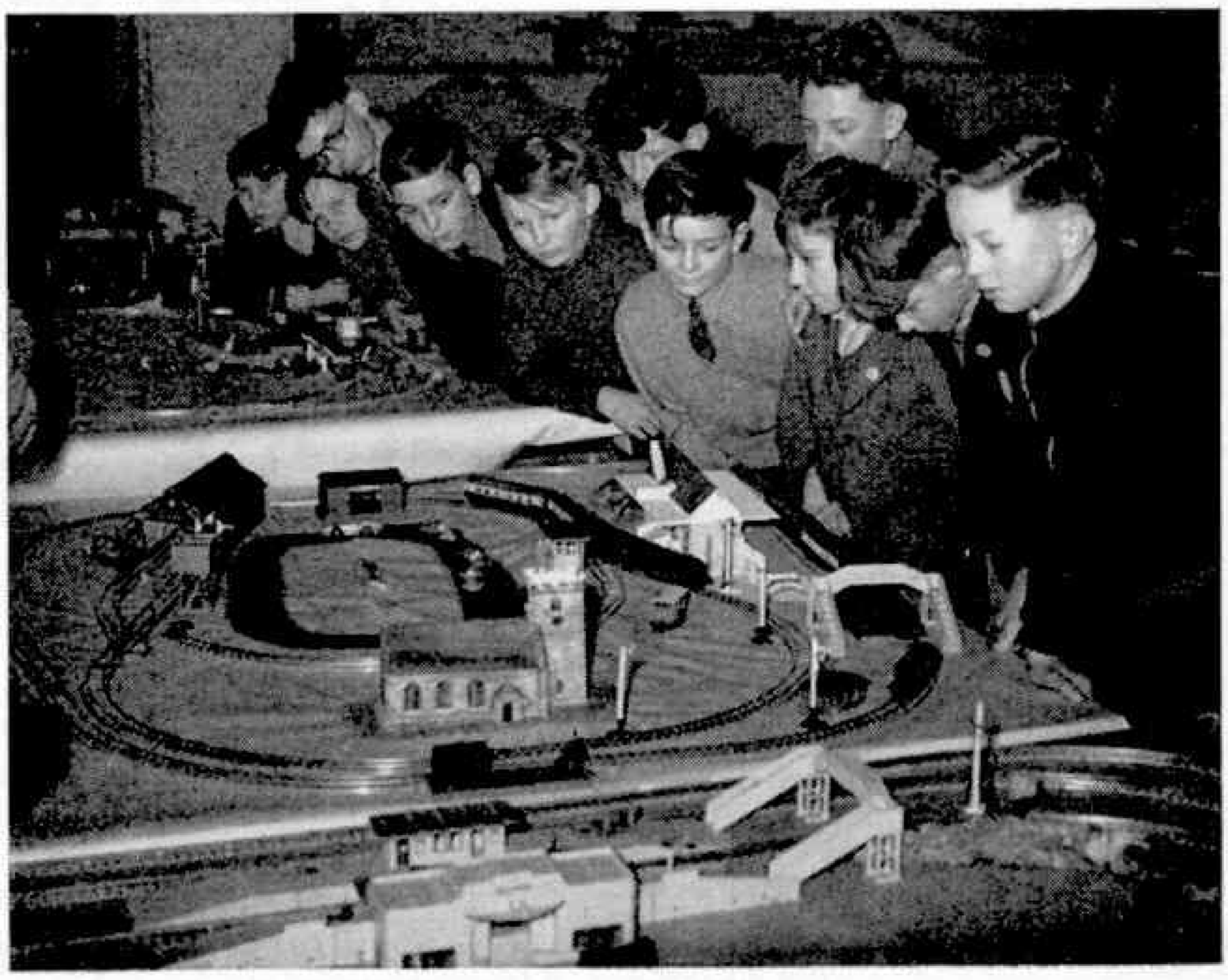
### NEW ZEALAND

CHRISTCHURCH (N.Z.) M.C.—The subjects of the Alison Cup Competition were a mystery model, a home built model of any subject, and a set home built model. The Cup was won by Peter Saunders, with W. Sherwood in second place. W. Sherwood won a Meccano Gears Outfit donated for the competition by Mr. Rothwell. Club roll: 21. *Secretary:* R. Boundy, 49 Eversham Crescent, Spriydon, S.W.1, Christchurch, New Zealand.

## BRANCH NEWS

NEWPORT C. OF E. JUNIOR BOYS' SCHOOL—The new Headmaster is taking an active interest in the Branch. The Branch track has been replanned, and it is hoped to extend it to working with two locomotives. Further improvements are under consideration. *Secretary:* J. Richardson, 78 White Pit Lane, Newport, I.o.W.

MARSH COURT SCHOOL (STOCKBRIDGE)—A nicely varied programme has been followed. The Branch track has been relaid and divided into electrical sections. Sub-committees have been elected to do research into the problem of providing lineside scenic effects. At two Open meetings the Branch layout was displayed to visitors. Several interesting lectures have been given, mainly by members, on railway topics. In lighter mood some enjoyable Quiz evenings have been held. *Secretary:* L. A. Leney, White Poplars, Chilbolton, Stockbridge, Hampshire.



**Proof of the fascination of model railways is seen in this excellent picture taken at the recent, and twelfth, annual Meccano and Model Railway Exhibition of the Barkers' Butts Boys Secondary School M. C., Coventry. The attractions included more than a dozen model railway layouts, and a fine display of working models. A novelty was an electrically operated model elephant that on the pressing of a button walked across the floor. Photograph by courtesy of the "Coventry Evening Telegraph."**

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*For other Stamp Advertisements see also pages 330 and xviii*

# Australian Commemorative Postmarks

By K. Allen

IN recent years Australian Postal authorities have realised the value of postmarks to publicise or commemorate national events and anniversaries. Such postmarks carry inscriptions and sometimes, for added emphasis, miniature pictorial representations. Others have slogans drawing attention to public campaigns, such as that for road safety, or warnings and reminders of approaching events.

Many Australian floral festivals have been publicised by postmarks. The celebrated JACARANDA FESTIVAL, best-known of this kind, which takes place at Grafton on the north coast of New South Wales, was marked by a special postmark last year on the 31st anniversary of the event, held between 28th October and 5th November.

This festival was inspired by the Cornish Floral Dance. It includes folk dancing, floral displays, aquatic and sporting activities, concerts and garden displays.

Some 3,000 jacaranda trees, first introduced in the 1870's, line the streets of Grafton.

The ST. GEORGE FESTIVAL OF FLOWERS, in the Sydney residential suburb of Hurstville, was the subject of postal commemoration in September 1955, with an illustrated slogan: "COME TO THE FESTIVAL OF FLOWERS, 13th SEPTEMBER–15th OCTOBER." This event, to raise funds for charitable causes, is patterned on the Pasadena Flower Festival, of California, and streets, business houses and public parks and gardens are gaily decorated.




Last year too Goulburn, in the southern tablelands of New South Wales, was featured with a slogan postmark for its annual LILAC TIME FESTIVAL, held from 30th September to 9th October. This festival has been the means of raising thousands of pounds towards the erection of a public hall.

Toowoomba, the "Garden City of Queensland," also celebrates an annual CARNIVAL OF FLOWERS, and the 1955 event was the subject of a new postmark available from 25th August to 24th September.

A festival of a different type is held annually at the Victorian town of Swan Hill, on the River Murray. This is a SHAKESPEARE FESTIVAL, which is generally observed on 14th April. In 1955 a new postmark appeared to publicise the event from 1st April to 22nd April. The Festival is sponsored by the Swan Hill Branch of the National Theatre Movement.

Education Week is another annual event represented by commemorative postmarks. EDUCATION WEEK, 1955 (14th to 20th AUGUST) was included in slogan form on Australian mail last year. The event is marked by special displays of students' work, exhibitions, talks and conducted tours of schools. It was originally a New South Wales "landmark," and was introduced into Victoria for the first time in 1955. Western Australia was included in the same year, and Queensland will publicise the event this year.

The motto: "JOIN THE R.A.A.F.—THE SERVICE WITH A FUTURE," accompanied by a representation of an aeroplane, figured on mail stamped at Australian post offices in 1948 for AIR FORCE WEEK. This honours those who fought and died during air battles of the Second World War, and specially commemorates the Battle of Britain of 1940.




One event featured in postmark form is AUSTRALIA DAY, 26th January. This is the anniversary of the day in 1788 on which Captain Arthur Phillip, of the Royal Navy, founded the first British settlement on the shores of Sydney Cove, Port Jackson, New South Wales.

Australia's adherence to the principles, aims and aspirations of the UNITED NATIONS ORGANIZATION also has been symbolised in the postmark slogan "UNITED NATIONS DAY—OCTOBER 24th," and another well known commemorative postmark came in February 1954, when the Australian Post Office marked a royal occasion with the message "AUSTRALIA CELEBRATES ROYAL VISIT 1954" at the beginning of the Australian tour of Her Majesty Queen Elizabeth II and the Duke of Edinburgh.

To draw attention to the 16th OLYMPIC GAMES another slogan postmark went on issue in December 1954. Using the Olympic interlinked circles and a lighted torch, the cancellation was worded: "OLYMPIC GAMES 1956. 22 NOVEMBER–8 DECEMBER, MELBOURNE." Special 2/– postage stamps have also been printed to publicise the Games.

Two major Scout Jamborees also have been celebrated on slogan postmarks. One coincided with the Pan Pacific Jamboree at Wonga Park, Victoria, and included the inscription, "PAN PACIFIC SCOUT JAMBOREE. VIC. DEC 29. JAN 9" (1949). The other was held at Greystanes, Parramatta, four years later.






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*For other Stamp Advertisements see also pages 328 and xviii*

# Stamp Gossip

By F. E. Metcalfe

### VIET-NAM

Although this country is turning out many stamps, there are so many from other countries that it is some time since its productions were mentioned. But who could resist the stamp illustrated? It is one of a set of six issued to commemorate the first anniversary of the arrival of refugees from what was then North Viet-Nam.

The refugees suffered greatly in their trek, and the stamp depicts in a wonderful manner some of their sufferings and hardships, as well as their courage. When will the world learn a bit of sense, and settle down to a reasonable mode of life that would eliminate the necessity for such happenings? It would be much better than conduct that causes these flights of terror, and then issuing stamps to glorify them.



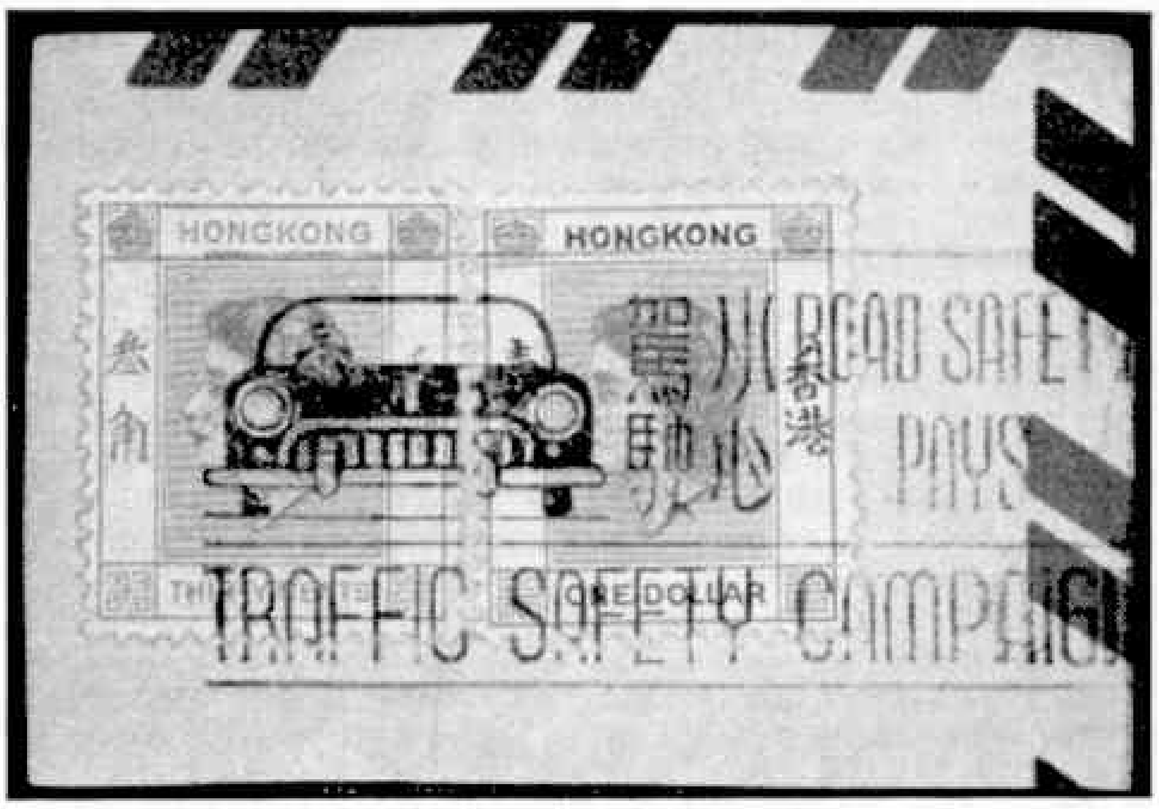

### THEMATIC COLLECTING

It is impossible to get away from this subject. Not that we need get away from it, for there must be many *M.M.* readers who are forming thematic collections and naturally wish to know "what's doing in the thematic world," as one reader put it in a letter received recently. Another Lancashire reader wrote a short while ago about stamps with designs of a religious character. A list of these stamps was asked for, but I am afraid that there are so many that it was only possible to indicate a number of countries that have issued such stamps.

The Americans describe this form of collecting as "topical," but I have never felt that the word is being correctly used in this connection. Anyhow, the American Topical Association states that its members collect 262 different themes, and it will interest my Farnworth correspondent to know that in the United States religious subjects are the second in popularity. Flowers take the first place, as I think they do here in Britain.




It is interesting too to note that Royalty has the comparatively high position of 14th in the list. Animals also are popular, so the two stamps issued by Canada on 12th April to commemorate the National Wildlife week will be snapped up by collectors all over the world.




### POSTMARKS

Since I wrote on postmarks, I have received letters showing that the subject interests many. So I thought that the postmark from Hong Kong reproduced on this page would be worth illustrating, particularly as it deals with a problem that will worry people here until something is done to stop those who tear along our packed roads as though they were out in the Sahara Desert.

### WATERMARKS

Several readers have written to tell me that they cannot distinguish the type of crown on the watermarks of our British stamps. Here is an easy way. All you want is a piece of red cellophane, the kind you would find on some Christmas crackers, or on a chocolate box. Put this on the *front* of the stamp, and look through both from the front, with a good light behind them. The watermark will then show up quite clearly. The outer top line of the new St. Edward's Crown has a dip in it.

### WEDDING BELLS

Postage stamps have been the chief export of Monaco for some time, so a nice hefty set was certain to materialise with such an event to honour as the marriage of their Prince.




There was a big rush to obtain copies of these "Wedding" stamps. If you bought a short set, don't imagine that they will ever be very valuable.

### THE MONTH'S TIP

I think most of my tips will be of our own Colonial stamps, for they seem to lend themselves better to investment.

This month I am going to mention two stamps. They are the 4½d. and 9d. values of the Queen Elizabeth set of Northern Rhodesia used. In the Commonwealth Catalogue, issued last back-end, they were priced at 1/6 and 2/6 respectively. Buy them at that price, providing they are good copies.

**Birds About the House**—(*Continued from page 283*)

for the blackbirds. Drinking water is always laid on and there are ample supplies of bread and butter for the small birds who need it.

Nesting boxes, carefully built and placed where cats cannot easily get at them, are to be seen in considerable numbers about the garden. There are teazels for the visiting charms of goldfinches and rambler roses to hide the spiders that the great tits enjoy, but the blue tits don't. There are wild medlar and crab apple trees, for the bullfinches, and other hedgerow fruit for the thrush tribe, while in the house are roosting boxes for the birds to sleep in. These comprise sugar cartons and cardboard rolls.

In high summer some of Miss Howard's tits go to bed as early as 6 p.m. in dull weather, and some individuals sleep for as long as twelve hours even in July. The younger birds often retire to bed soon after 8 p.m. or a little later, and rise around 5 a.m.

Writing a book is not easy work at the best of times. For Miss Howard the job is particularly difficult. Sometimes young tits will pull her hair as she writes of them. More than once an enterprising bird has flown to another corner of the room with her fountain pen. Manuscripts left exposed may be quickly torn, and the telephone directory has to be well hidden.

To surrender one's life to the birds as Miss Howard has done calls for real self-sacrifice. Thousands of bird watchers—and birds—are in her debt.

---

**Flying at 1,650 m.p.h.!**—(*Continued from page 286*)

record for Britain. If Peter had lost a mere 328 ft. of height during his speed runs, when he had only his altimeter and radio messages from the ground to guide him over the measured course of 7¼ miles below, and which he could not see from his cockpit, the record attempt would have failed.

Instead, all went well. He beat the old record by the unprecedented margin of 37 per cent. and gave the finest possible answer to people who say that Britain's aircraft industry is becoming second-rate. With pilots like Yeager and Twiss, and aircraft like the X-1A and Delta 2 for them to fly, neither the British nor the American aircraft industries will ever become second-rate—for these are men who have learned to outfly the Sun, which crawls round the Equator at a mere 1,040 m.p.h.

---

**Traction Engine Journey**—(*Continued from page 295*)

with water getting low. A small stream was located outside the Race Course, and was soon cleared of bricks sufficiently to allow the end of the lift pipe to be well covered.

Then came trouble! The lifter would not lift! About this time a policeman on a bicycle stopped and surveyed the scene with a mixture of "What are you up to?" and amusement. Shortly after this a patrol car pulled up, but after a short conversation with the policeman, the driver went away, no doubt assured that we were quite harmless. Some miles further on the occupants of the car noticed two grimy looking individuals, with their car parked at the side of the road, digging furiously in a ditch. They were trying to get the water to flow sufficiently fast to enable us to lift when we arrived.

By this time, I was beginning to think that we were playing our luck rather hard, but we pushed on to Great Glen, where again we filled the engine, and water was taken once more before Market Harborough was passed at 5.00 p.m., much to the amusement of my wife's relatives who live there and came with other members of the family to wave us by. This part of the trip ended at the Fenland Garage, Brixworth, where we were kindly allowed to leave *Kitchener* until the following week-end.

The third and last day of our trip was sunny and fine like the previous two. We lit the fire at 7.45 and were ready to go by 9.20, but delayed our departure to allow us to clean the engine down, as we wanted to look our best when we reached our journey's end.

By 10 o'clock we were on the road and had passed through Northampton by 11.15 a.m. So on to the Northampton-Wellingborough level crossing, where we were met by several car loads of friends who had motored the twenty miles from Bedford to see us on the road.

After nearly everyone present had mounted the footplate and passed approval of the purchase we continued, reaching Stagsden, our destination, at 2.15 p.m.—after one more halt for water.

---

**Motorways for Safety**—(*Continued from page 289*)

reflected in the reduced accident figures.

Nowhere in the world, perhaps, is there greater traffic congestion than in London, and it is getting worse every year. In each mile of central London at the daily rush-hour periods some 200 or 300 people are sitting impatiently in cars, taxis, buses and lorries brought to a standstill by street congestion. Most of the day, in fact, traffic crawls literally at snail's pace through the West End and the City.

Many plans for solving London's problem have been put forward, but the most imaginative is that known as the Inner Ring Road. This was one of a series of orbital roads for through motor traffic detailed in the County of London Plan, 1943. The Inner Ring Road is an 11-mile motorway constructed at a radius of one or two miles from the centre. Over much of the route it would be sunk in cuttings or carried on viaducts, below or above street level; the road would tunnel under Hyde Park and under the river Thames somewhere near Tower Bridge, returning across the river by a new bridge at Vauxhall.

Certainly a London motorway of this sort would be costly and difficult to construct. But it could be done, as it has been done in cities abroad, and the benefits it would bring in reducing street accidents and getting London's traffic on the move again would be incalculable. It has been established that one urban motorway can carry as much traffic as five city streets 40 ft. wide where parking is prohibited, or eight similar streets where parking is allowed.

---

**ACKNOWLEDGMENT**

No acknowledgment was given for the illustrations to the article "Silos for Sugar" that appeared in last month's *M.M.* They were reproduced by courtesy of John Laing and Son Limited, London S.W.1.

* * * *

Mr. Michael J. Imrie, who sent in an enquiry about cycle insurance recently, is asked to write again, as his previous communication did not give his address.

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# Fireside Fun

"You say typographical errors often bring out the truth?"

"Yes, listen to this item: 'The doctor felt the patient's purse and announced there was no hope!' "

* * * *

A telephone service girl received a call from an elderly lady: "My telephone cord," she said, "is too long. Will you please pull it back at your end?"

* * * *

He who laughs last has only just seen the joke!

* * * *

City Editor: "But how do you sell papers in a small place like this, where everyone knows what everyone else is doing?"

Small Town Editor: "They buy the papers to find out who's been caught at it."

* * * *




* * * *

Sergeant to recruits: "This type of bullet will penetrate two feet of solid wood, so mind you keep your heads down!"

* * * *

"A young couple got a preacher out of bed at 3 a.m. and asked him to marry them," said the Editor to the young reporter. "Now, how would you head that if you were me?"

"Oh, that's easy" said the reporter. "I'd just head it 'Parson ties knot in his shirt'."

* * * *

Tom: "You are always wishing for what you haven't got."

Bob: "Well, what else could I wish for?"

* * * *

A stout little man was explaining his tennis game.

"When my opponent hits the ball to me," he declared, "my brain immediately barks out a command to my body: 'Race up to the net, slam a blistering drive to the corner of the court, and jump back into position'."

"Yes, yes, and then what happens?" asked his friend.

"Then my body says, 'who—me?' "

A lad from New York turned up at the cook house of a Texas holiday camp carrying the rattles from a rattlesnake. "Where did you get them?" asked the cook. "Off a big worm" answered the big-city holidaymaker!

* * * *

Asked what he thought of the two candidates in a local election Jones replied "Well, when I look at them, I'm thankful only one of them can be elected."

* * * *

A lively youngster on an air liner was driving everyone crazy running up and down the aisle. He ran smack into the stewardess serving coffee and knocked all the coffee and cups to the floor.

As she cleaned up the mess, the stewardess glanced at the boy and said "Say, sonny, why don't you go outside and play?"

* * * *

Visitor: "Is smoking permitted here?"

Attendant: "No."

Visitor: "Well, where did all these cigarette ends come from?"

Attendant: "From folks who didn't ask questions."

* * * *

Mother was ill. So Jill, aged 8, sat in her chair at dinner.

"Oh, so you're acting mother tonight are you?" said her brother. "Well, if you're mother, how much is 6 times 9?"

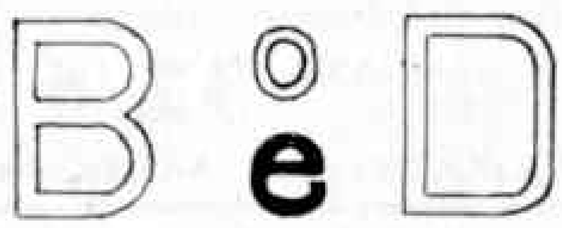
Calmly, Jill retorted, "I'm busy, ask your father."

* * * *

## BRAIN TEASERS

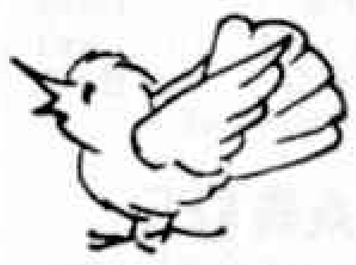
### A TRANSLATION TEST

Can you translate the queer arrangement of letters herewith and find their meaning?




* * *

### HOW BIG WAS THE FAMILY?



An entire family lived in one house. It consisted of three mothers, three daughters, two aunts, a young son, two cousins, two sisters, two grandchildren, a nephew, a niece and a grandmother. What is the smallest number of people this could represent. (M.G.)

* * * *

### THE BOOK-WORM

If a book-worm ate from the first page of Volume 1 to the last page of Volume 3 of an encyclopædia standing in their right order on a bookshelf, how far would he have eaten, the books being 2 inches thick each and the covers ¼ inch thick.

* * * *

## ANSWERS TO LAST MONTH'S PUZZLES

### The Lost Wild Flower

The name of the flower is FOXGLOVE.

* * * *

### Mixed Centres

The five seven letter words indicated by the clues are: Spanner, Enjoyed, Andante, Prevail, Strayed.

* * * *

### Five Minute Crossword

The solution to the five-minute crossword is shown herewith.

| | | | | |
|---|---|---|---|---|
| 1 R | O | 2 U | E | 3 N |
| A | ■ | P | ■ | E |
| 4 T | A | P | E | R |
| E | ■ | E | ■ | V |
| 5 S | E | R | V | E |

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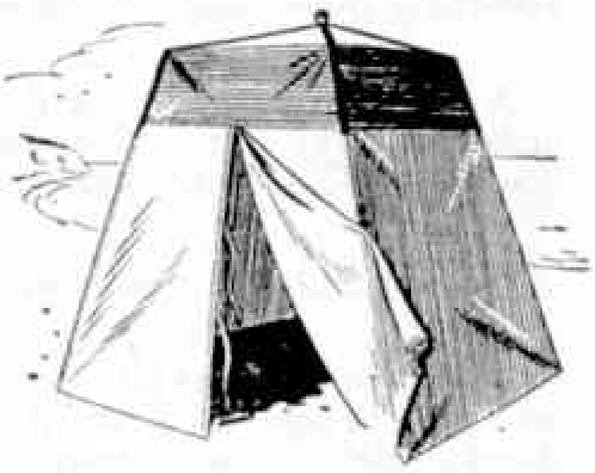
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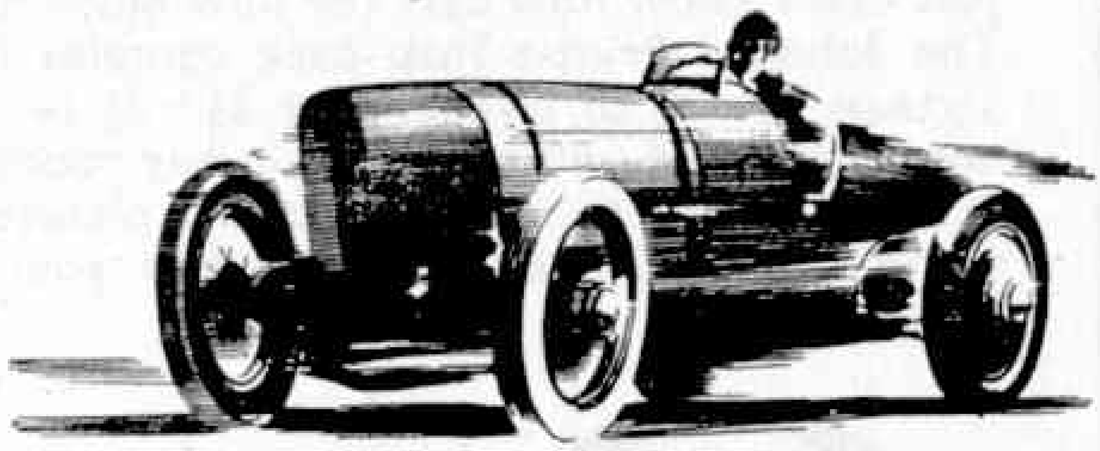
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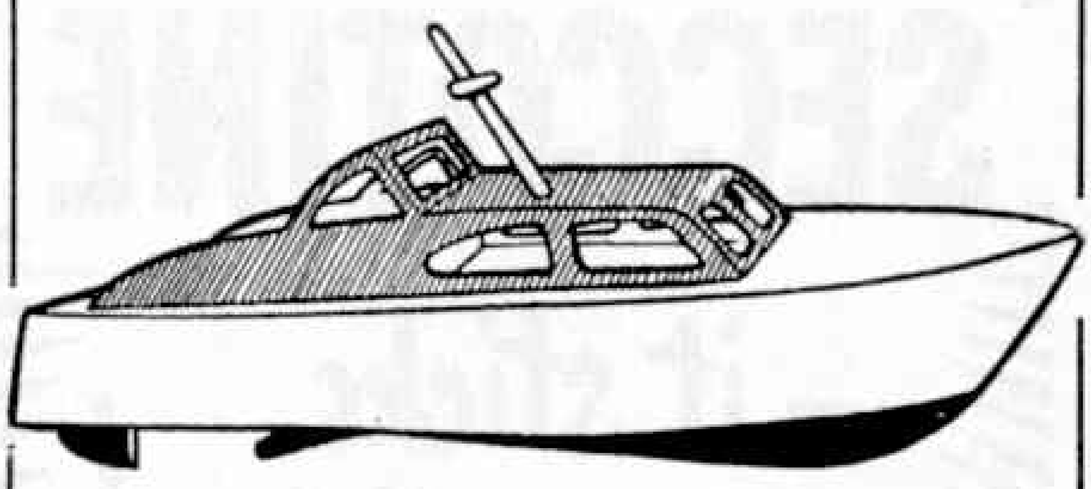
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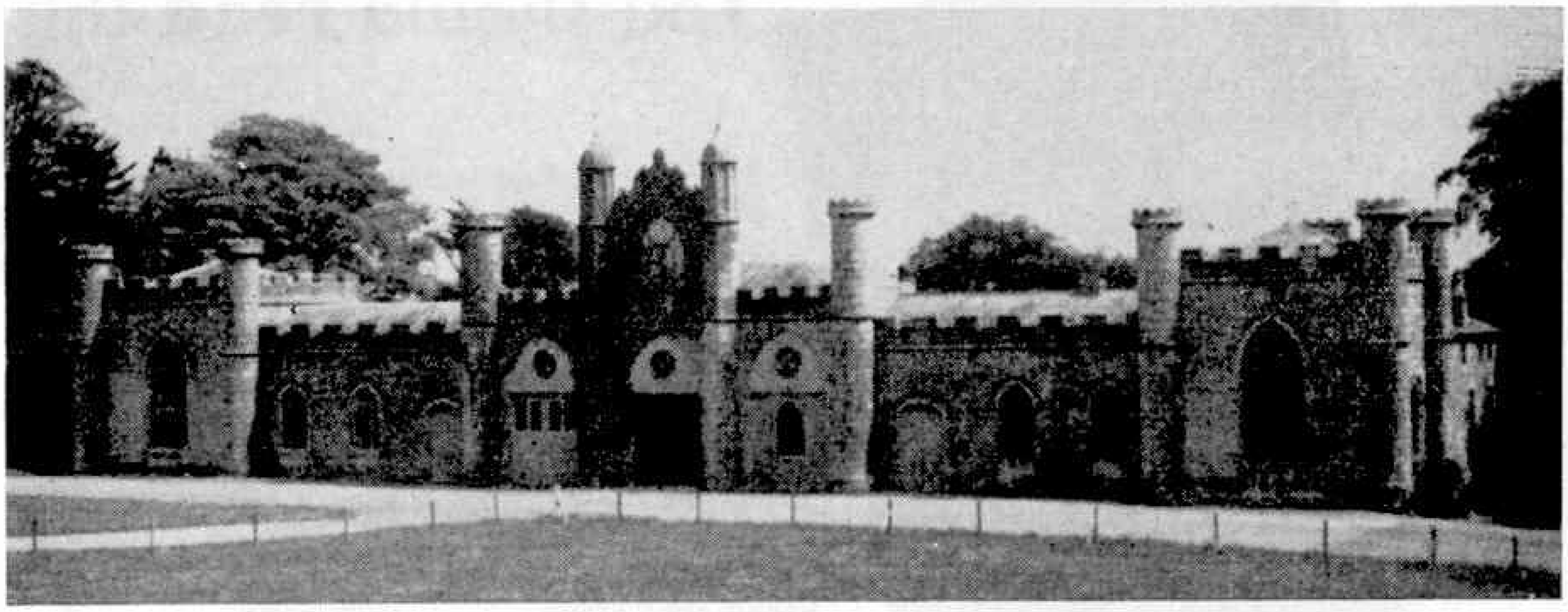
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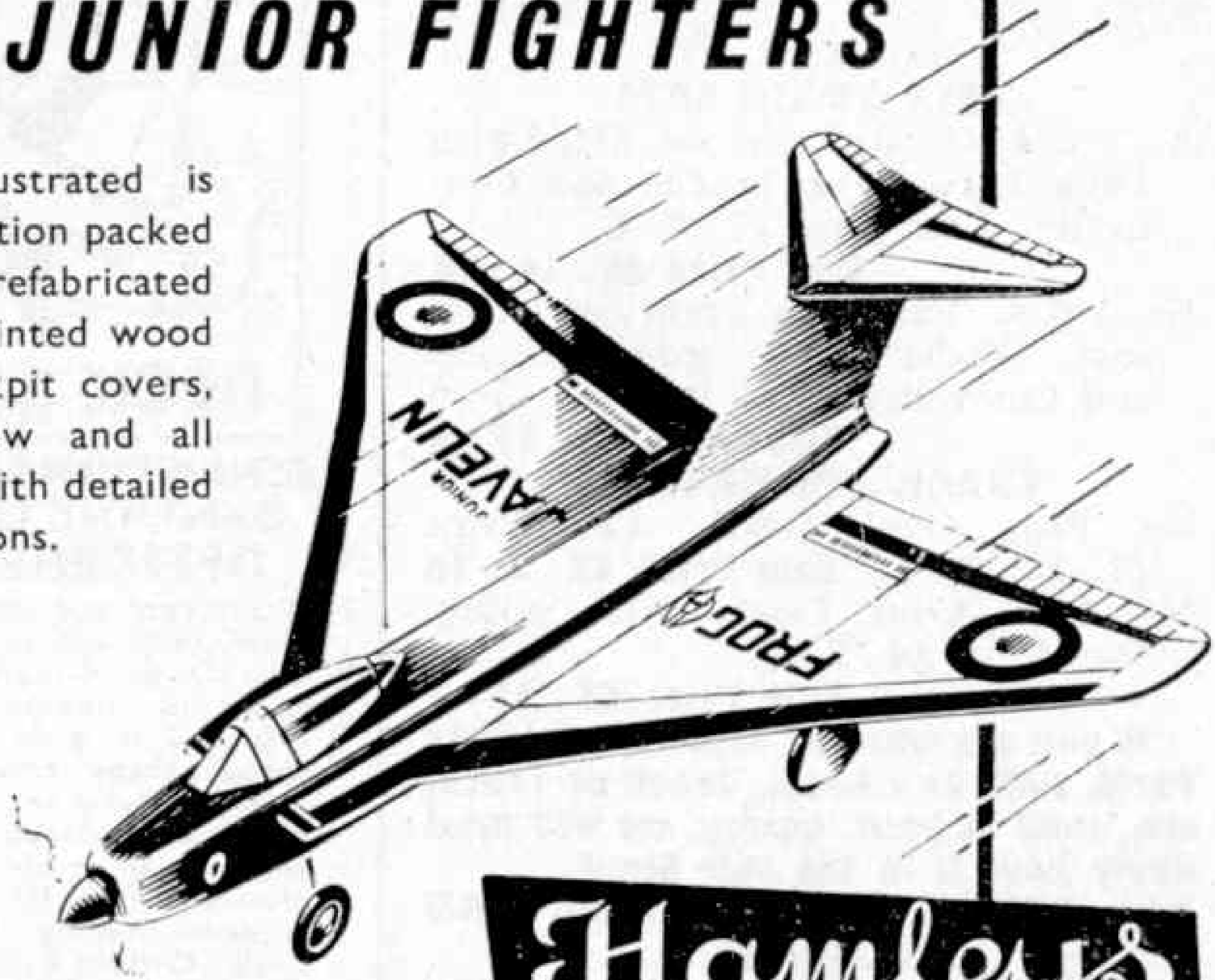
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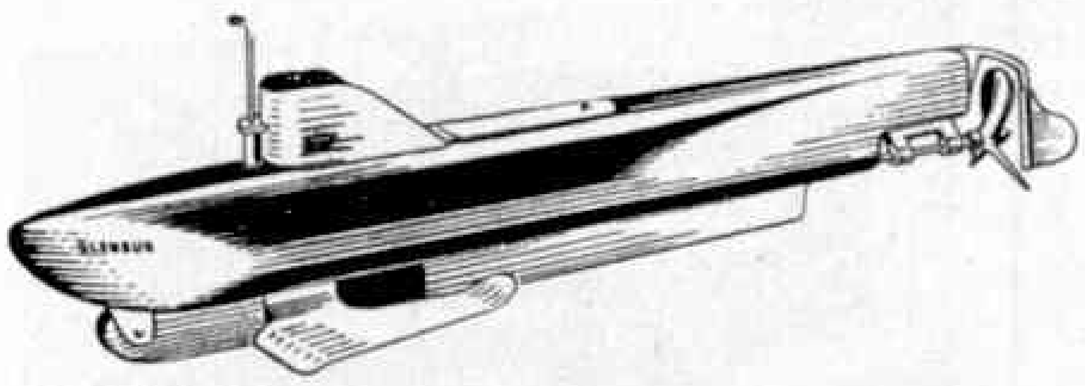
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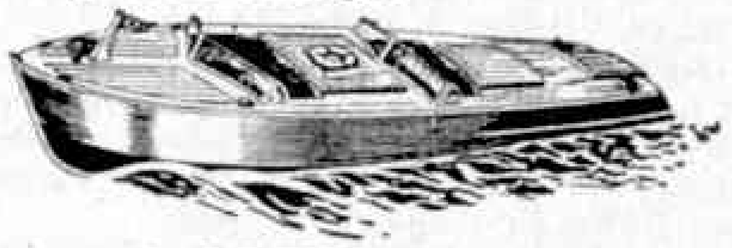
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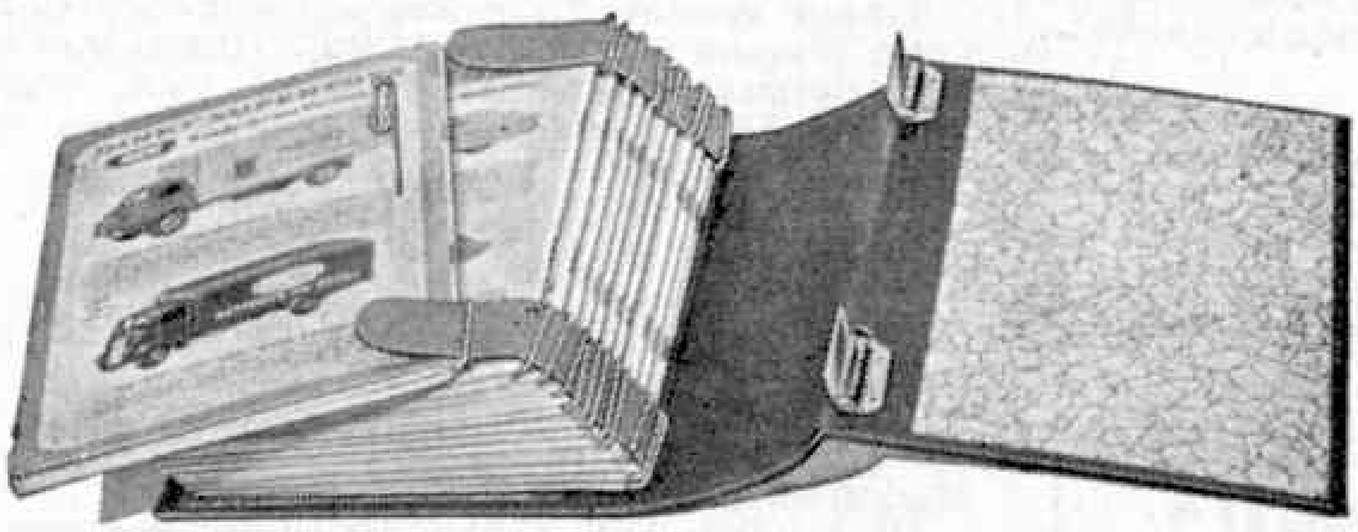
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"Trains Illustrated" No. 15 to May 1955, reasonable condition. Offers to—J. Morgan, 271 North Road, Plymouth.

Marklin 0 gauge Locos., Track, Rolling Stock, Transformer, Stations, etc. Apply—Pugsley, 10 Heanton Crescent, Braunton, N. Devon.

"M.M.s" May 1950 to December 1955 (September 1954 missing), four with loose covers, others perfect. What offers, cash or exchange?—Box No. 97.

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*(see also pages 328 and 330)*

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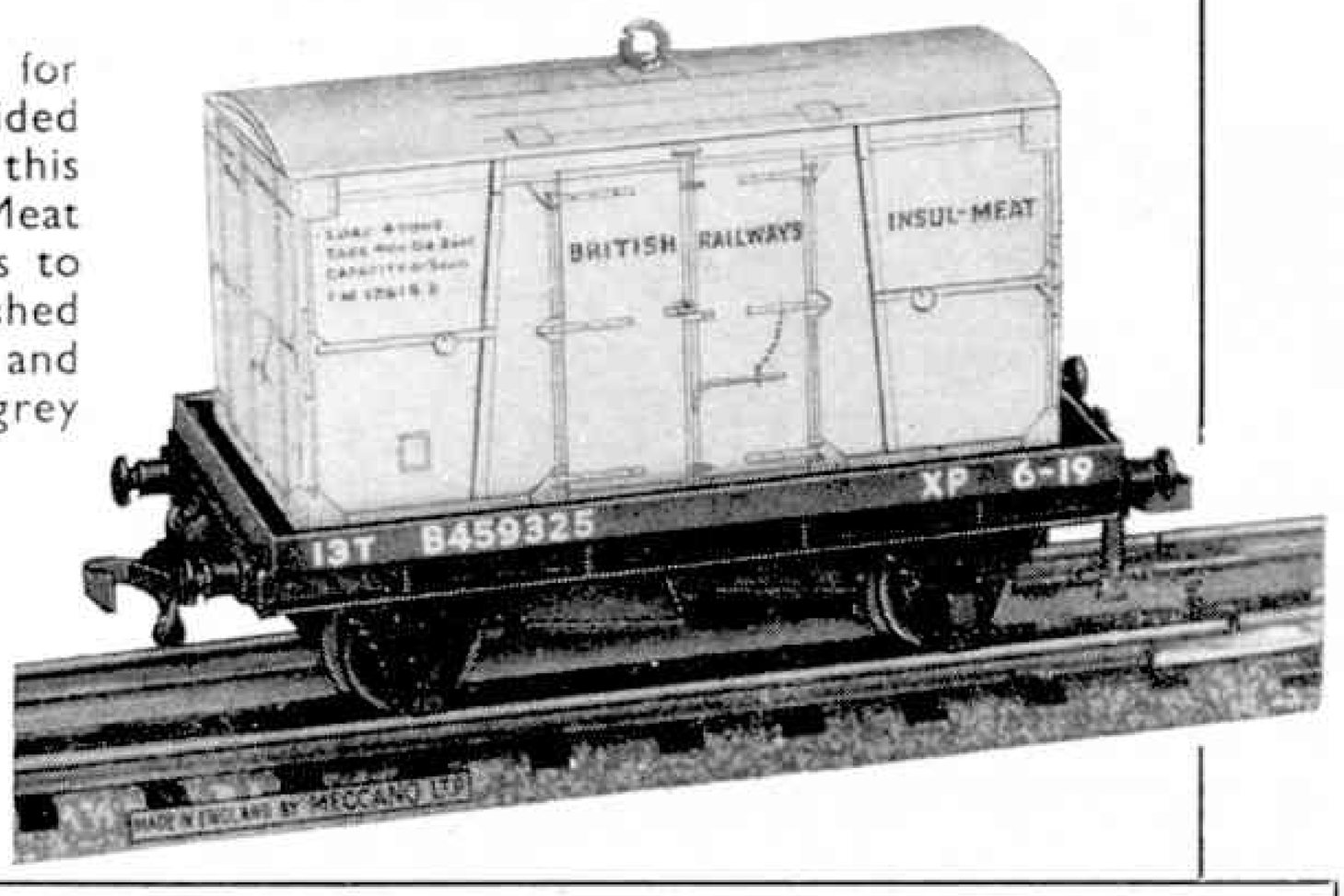
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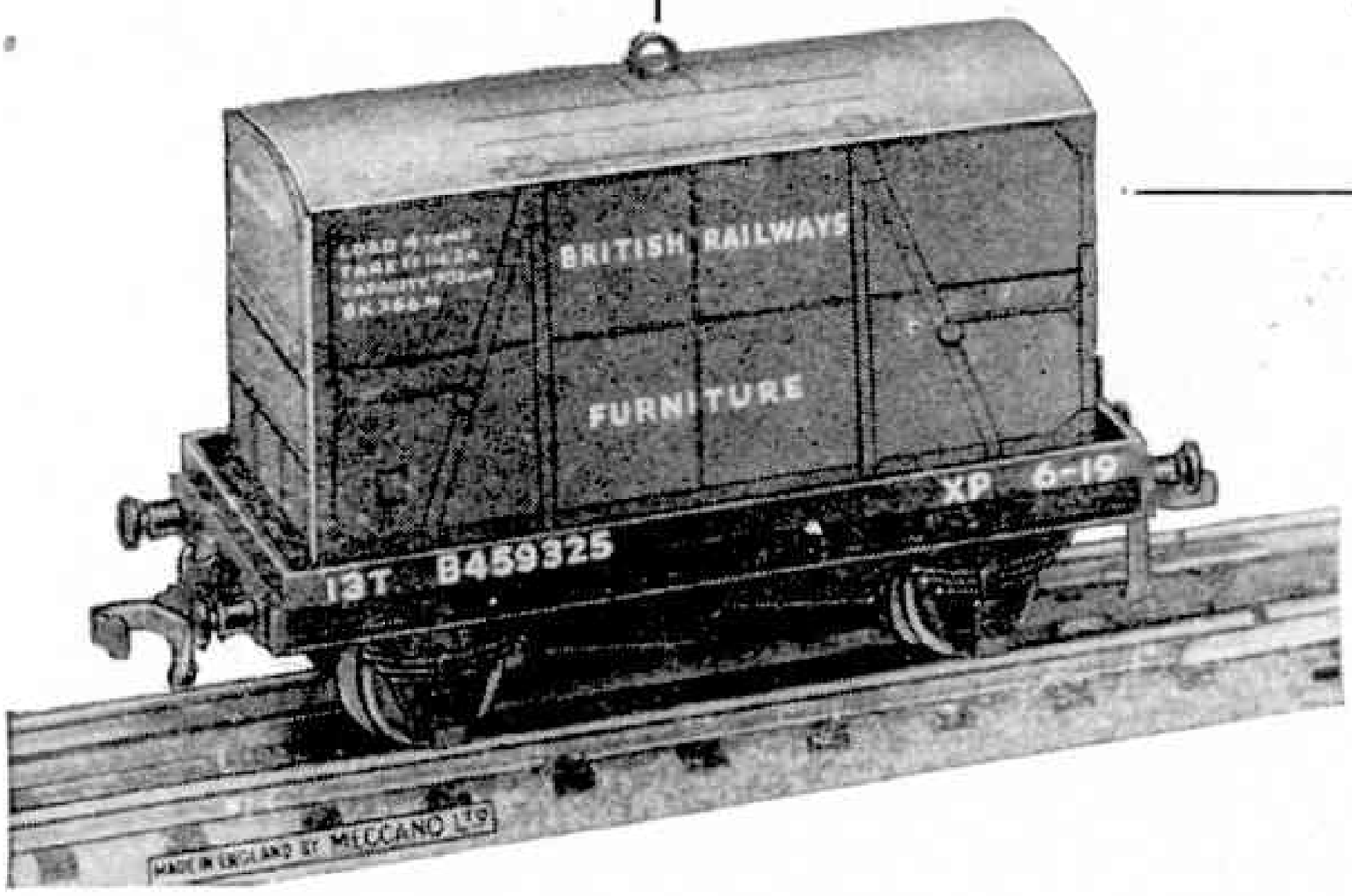
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# MODEL OF THE MONTH

## EXCAVATOR

### Assembly of the Undercarriage.

The Undercarriage is shown seperately in Fig. 2. The centre section is made by bolting two 7½" Angle Girders 1 between two 5½" Angle Girders, one of which is indicated at 2. Four vertical 2½" Angle Girders 3 are fixed to the Girders 1 and these four Girders are connected at their upper ends by four 4½" Angle Girders 4. The lower ends of the Girders 3 on each side are connected by further 4½" Angle Girders.

A 4" Circular Plate, with a Face Plate fixed centrally to it, is bolted to two 4½" Angle Girders supported by two of the Girders 4.

Each of the track assemblies is made by connecting two 9½" Angle Girders 5 and a 9½" Strip at each end to a Flat Trunnion. A 2½" x ½" Double Angle Strip is fixed vertically at each end of the Girders 5 and a third Double Angle Strip is attached similarly to the centres of the Girders. The parts used to represent the creeper track are attached to the lugs of the three Double Angle Strips. The track is built up from four 5½" x 1½" Flexible Plates and two 9½" Strips, with further 9½" Strips bolted to the edges of the Plates for strengthening purposes. A series of 1½" Strips fixed across the Plates represent the track sections.

The track assemblies are fixed in place by bolting them to the Girders 2. Four 3" Angle Girders 6 are bolted to the Girders 1, and to each of these a 2" Sprocket and a Face Plate are attached by a 1½" Bolt. Two Wheel Discs are bolted to the lower one of the Girders 5 on each side, and two 2" Pulleys are mounted freely on ¾" Bolts attached to the same Girder by two nuts each.

### Details of the Cab.

The base of the cab is formed by two 9½" Angle Girders 7 connected by three 7½" Angle Girders indicated at 8 and 9. Two 7½" Angle Girders 10 are fixed between the Girders 8 (Fig. 3), and a 4½" x 2½" and two 5½" x 2½" Flat Plates are fixed to these Girders.

Each side of the cab consists of a 2½" x 2½" and two 5½" x 2½" Flexible Plates strengthened by Strips, with further Strips used to represent the window frame. The sliding door (Fig. 1) is made by bolting a 2½" x 2½" Flexible Plate and 2½" Strips to two vertical 5½" Strips. The ends of the 5½" Strips are arranged between pairs of 5½" Strips 11 that form guides. Each pair consists of two 5½" Strips spaced by Washers on ⅜ Bolts, with further Washers between the Strips and the side of the cab. On the side opposite to the one seen in Fig. 1 the door constructed similarly but it is fixed in place and does not open.

The rear of the cab is made from two 5½" x 2½" Flexible Plates and two 2½" x 2½" Flexible Plates, with Strips used to make the window frame. The back is attached to the sides by Obtuse Angle Brackets. Each side of the front of the cab is made by bolting a 2½" x 2½" Flexible Plate and two 3½" Strips to 2½" Angle Girders, which are fixed to the front one of the Girders 8. The 3½" Strips are connected at their upper ends by a 2½" x ½" Double Angle Strip and a 2½" Curved Strip.

At this stage the roof of the cab can be made, but it should not be bolted in place until the mechanism is installed. The main section of the roof consists of six 4½" x 2½" Flexible Plates bolted together in pairs, with two 2½" x 1½" Flexible Plates and two 2½" x 2" Triangular Flexible Plates arranged to cover the rounded section at the rear. The front section of the roof consists of Strips arranged as seen

in Fig. 1. When the model is completed the roof is attached to the sides, rear and front of the cab by Angle Brackets and Obtuse Angle Brackets.

## Details of the Roller Bearing (Fig. 4).

Each roller of the bearing unit is a $\frac{1}{2}$" fixed Pulley that is free to turn on a $\frac{3}{4}$" Bolt held by two nuts in a 1" x $\frac{1}{2}$" Angle Bracket 12. These Angle Brackets are bolted to the base of the cab and to them are fixed further 1" x$\frac{1}{2}$" Angle Bracket that support a 4" Circular Plate. It should be noted that the $\frac{1}{2}$" Pulleys must not touch this Circular Plate. which has a Face Plate bolted to it.

A 57-tooth Gear is fixed to one end of a 2" Rod, with a Collar approximately $\frac{1}{4}$" below the Gear. The Rod is passed through the Face Plate attached to the cab section of the bearing, and is fixed in the Face Plate bolted to the undercarriage. The cab can be turned or slewed by means of a handle formed by a threaded Pin in a Double Arm Crank. The Double Arm Crank is fixed on a 6$\frac{1}{2}$" Rod mounted in the Girders 10 and held in place by a Collar. A Worm 13 on the Rod engages the 57-tooth Gear.

## The Jib, Bucket Arm and the Bucket.

Each side of the jib consists of two 12$\frac{1}{2}$" Angle Girders joined by a 3" Flat Girder 14 and a 1$\frac{1}{2}$" Flat Girder that supports a 1$\frac{1}{2}$" Corner Bracket 15. The Sides are conneted as shown by 1$\frac{1}{2}$" Strips, and the Flat Girders 14 are bent slightly so that a 2$\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip can be fitted between their lower ends. A 2" Flat Girder is supported by two 1$\frac{1}{2}$" Strips bolted to the Double Angle Strip, and a 1" Triangular Plate is fixed to each of the Flat Girders 14. The jib pivots on a 3$\frac{1}{2}$" Rod passed through the Triangular Plates and through the lugs on a 2$\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip bolted to the front of the Cab.

The bucket arm is formed by two 9$\frac{1}{2}$" Angle Girders and it pivots on a 2$\frac{1}{2}$" Rod held in the jib by Collars. A 1" Triangular Plate is bolted to each side of the arm and two Double Brackets are fixed to the Triangular Plates and to a 2$\frac{1}{2}$" Flat Girder, which is attached to 1$\frac{1}{2}$" Angle Girders bolted to the sides of the bucket. Each side is made from a 2$\frac{1}{2}$" x 1$\frac{1}{2}$" Flexible Plate and a 2$\frac{1}{2}$" x 1$\frac{1}{2}$" Triangular Flexible Plate. The base of the bucket is a 2$\frac{1}{2}$" x 2$\frac{1}{2}$" Flexible Plate attached to 2$\frac{1}{2}$" Angle Girders bolted to the sides.

The hinged flap of the bucket is a 2$\frac{1}{2}$" x 2$\frac{1}{2}$" Flexible Plate extended downward one row of holes by a 2$\frac{1}{2}$" x 1$\frac{1}{2}$" Flexible Plate. A 2$\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip is bolted to the upper edge of the flap. and a 3$\frac{1}{2}$" rod is passed through the lugs of this Double Angle Strip and through the slotted holes of Fishplates 16. Normally the lower edge of the flap engages in front of a bolt 17, which is fixed by a nut in a Fishplate bolted to the base. To release the flap for unloading the bucket, it is raised in the slotted holes in the Fishplates 16 until its edge clears the bolt 17. The flap is raised by means of a Cord fastened inside the cab, passed round the Rod on which the bucket arm pivots, and tied to the 3$\frac{1}{2}$" Rod mounted in Fishplate 16.

## The Motor and Gear Box.

An E20R(S) Electric Motor is bolted to one of the Girders 8 and is connected to the Girder 9 by a $\frac{1}{2}$" Reversed Angle Bracket. A $\frac{1}{2}$" Pinion on the armature shaft drives a 57-tooth Gear on a 4" Rod 18, mounted in the Motor side Plates. A 57-tooth Gear 19 is fixed on a 2" Rod supported in 1$\frac{1}{2}$" Flat Girders bolted to 1." Angle Girders fixed to the Motor, and this Rod carries also a $\frac{3}{4}$" Sprocket 20. The Motor control switch is extended by a 4$\frac{1}{2}$" Strip 21.

The gear-box housing is formed two 3½" x 2½" Flanged Plates connected by two 2½" x 2½" Flat Plates, and it is supported by four 1½" Strips bolted to the Girders 10. A 3" Sprocket 21 is fixed on a 4" Rod that carries a 1" Gear 22 and a ½" Pinion 23. and the Sprocket is connected by Chain to the ¾" Sprocket 20. The Pinion drives two ½" Pinions 24, each of which is mounted freely on a ¾" Bolt fixed in the housing by two nuts. Two 1½" Corner Brackets are bolted to the housing and these support a Rod 25 that carries a 1" Pulley 26.

The two winding drum shafts are identical in design and in operation. Each consists of a 4" Rod fitted with a 1" Gear 27. a ½" Pinion 28, a ½" Pulley 29 and a winding drum formed by two Bush Wheels placed with their bosses together. By sliding the shaft in its bearings the Gears 27 and 22 can be brought into mesh, or the Pinions 28 and 24 can be engaged to reverse the direction of the drive. The sliding movement of the shaft is controlled by a 3½" Strip 30 that is lock-nutted to one lug of a 1½" x ½" Double Strip bolted to the gear-box housing. A ⅜" Bolt held in the Strip by two nuts engages between the Pulley 29 and a Collar on the shaft. A light braking effect is maintained by a 2½" Driving Band passed round Pulley 29 and looped over a ⅜" Bolt fixed in the housing.

Arrangements of the Cords.T

A length of Cord tied to the drum on the front winding shaft is passed round a 1" Pulley on a 2½" Rod 31, round the Pulley 26 and round a second 1" Pulley on Rod 31. This Cord finally is tied to the Rod 25. A length of Cord fastened to the second drum is passed over a 1" Pulley on a 2½" Rod 32, and is tied to one of three Bolts used to join together two 1" Triangular Plates. A small Loaded Hook is pivoted on another of these Bolts and is attached to the bucket.

Parts required to build the Excavator:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | of No. | 1a | 4 | of No. | 12 | 62 | of No. | 38 | 6 | of No. | 109 |
| 2 | " " | 1b | 8 | " " | 12b | 2 | " " | 40 | 10 | " " | 111 |
| 15 | " " | 2 | 12 | " " | 12c | 1 | " " | 48 | 10 | " " | 111c |
| 11 | " " | 2a | 1 | " " | 14 | 10 | " " | 48a | 4 | " " | 111d |
| 13 | " " | 3 | 3 | " " | 15b | 2 | " " | 53 | 1 | " " | 115 |
| 4 | " " | 4 | 2 | " " | 16 | 1 | " " | 53a | 1 | " " | 125 |
| 12 | " " | 5 | 3 | " " | 16a | 1 | " " | 57c | 4 | " " | 126a |
| 5 | " " | 6 | 2 | " " | 17 | 13 | " " | 59 | 4 | " " | 133 |
| 39 | " " | 6a | 4 | " " | 20a | 1 | " " | 62b | 2 | " " | 133a |
| 4 | " " | 8 | 3 | " " | 22 | 2 | " " | 70 | 2 | " " | 146a |
| 8 | " " | 8a | 1 | " " | 22a | 4 | " " | 77 | 2 | " " | 186 |
| 7 | " " | 8b | 6 | " " | 23a | 2 | " " | 90 | 5 | " " | 188 |
| 2 | " " | 9 | 4 | " " | 24 | 1 | " " | 94 | 8 | " " | 189 |
| 6 | " " | 9a | 4 | " " | 24a | 4 | " " | 95 | 10 | " " | 190 |
| 1 | " " | 9b | 6 | " " | 26 | 1 | " " | 95b | 6 | " " | 191 |
| 4 | " " | 9c | 3 | " " | 27a | 1 | " " | 96a | 6 | " " | 192 |
| 10 | " " | 9d | 3 | " " | 31 | 2 | " " | 103e | 4 | " " | 221 |
| 4 | " " | 9f | 1 | " " | 32 | 1 | " " | 103f | 2 | " " | 222 |
| 6 | " " | 10 | 395 | " " | 37a | 1 | " " | 103g | 1 | E20R(S) Electric Motor. | |
| 2 | " " | 11 | 438 | " " | 37b | 4 | " " | 103h | | | |